THE

AMERICAN GAS-LIGHT JOURNAL

DEVOTED TO

LIGHT, HEAT, WATER-SUPPLY, AND SEWERAGE.

Iron Buildings, Nos. 254 & 256 Canal Street, East, near Broadway, New York.

VOL. II.—No. 15. NEW-YORK, WEDNESDAY, AUGUST 1, 1860. $3 PER ANNUM.

TO GAS-FITTERS & PLUMBERS.—L. Waefeler & Co., No. 94 Beekman street, New York, have always on hand several hundred kegs WROUGHT-IRON GAS-PIPE HOOKS, of all sizes from ¼ to 2 inches. They are made of best quality horse-shoe nail iron, and warranted not to break. Also, PLUMBERS' MATERIALS, such as China Wash-Basins, Closet-Basins, Pan-Closets, Bath Tubs, Boilers, Brass and Silve-plated Cocks, Brass and Iron Pumps, Hydraulic Rams, French Fountain Jets, &c., all at the very lowest prices.

BUTTS & KENDALL, (Formerly F. Butts & Co.,) Dealers in STERLING COAL, Cleveland, Ohio.—The attention of Gas Companies is called to the following letters as to the merits of the above Coal, being a few of the many we have received, and from which we are led to believe that there is no English or American Coal which combines all the qualities desired in a Gas Coal as perfectly as the Sterling :—

Office of the Manhattan Gas Light Co.,
New York, January 13, 1860.

MESSRS. BUTTS & KENDALL :—*Gentlemen* :—Yours of 9th inst. is received. The "Sterling Coal" received from you during the past year worked very satisfactorily—averaging 9520 cubic feet of 15 candle Gas per ton of 2240 lbs., and 41 bushels of Coke, weighing 1465 lbs. We consider it among the best of American Gas Coals, for the quantity and quality of the Gas produced, and also for the excellent quality of its Coke. I am, Gentlemen, your obedient servant, CHARLES ROOME, Pres.

Office of the Rondout and Kingston Gas Light Co., Rondout, *Jan.* 4, 1860.

MESSRS BUTTS & KENDALL :—*Gentlemen* :—The 600 tons of Sterling Coal ordered from you in August, 1859, has now been in use over four months, to my entire satisfaction. Its average yield is 4, 40-100 feet, and a good strong light. The Coke produced equal in quality and quantity, to best English Coking Coals. It burns very freely with little clinker. In purification it is economical, using no more lime than New Pelton. It is superior to any American Coal I ever used. I shall be pleased to give you any further information at my office in New York.

WM. W. HAGUE, 523 Broadway.

The Cleveland Gas Light and Coke Co.
Office, 195 *Superior-St., Cleveland, Dec.* 30, 1859.

MESSRS. BUTTS & KENDALL :—*Gentlemen* :—This Company has used between 3000 and 4000 tons of your "Sterling Coal," and are still using it with very satisfactory results. We find the average product of a ton of 2000 lbs. is about 8500 feet of Gas and about 37 bushels of Coke. The Gas is of good illuminating power and quite free from sulphur or other impurities, one bushel of lime purifying 9000 feet, and the Coke of very superior quality. The yield of Gas is about the same as from the Pittsburgh Coal, and the Coke better adapted to our use. Yours, truly, T. DWIGHT ELLIS, Sec.

Office of the Sandusky, O., Gas Co., *Jan.* 16, 1860

MESSRS. BUTTS & KENDALL:—*Gentlemen* :—This Company has used your Sterling Coal since (July 8d, 1859, and are still continuing the us of it with satisfaction to the Company and consumers. The average product has been 8,629 feet of Gas per ton of 2,000 lbs, and 37 bushels of Coke of very superior quality. The Gas is as good as that obtained from Pittsburgh Coal. I consider it the best Coal ever used in our works. I am gentlemen, yours respectfully, WM HUDSON, Sup't & Sec'y.

We would also refer to Gas Companies in the following places :—New York City (Manhattan and New York Co's), Albany, Troy, West Troy, Rochester, Oswego, Rondout, Kingston, Albion, Brockport, Seneca Falls, Elmira and Lyons, in the State of New York ; Cleveland, Toledo, Sandusky, Norwalk and Oberlin, in Ohio ; Detroit, Ann Arbor, Grand Rapids and Kalamazoo, in Michigan ; Coburg, in Canada, and two Companies in Milwaukie, Wisconsin.

The extensive Mines of the Sterling Coal and Mining Company, in the western part of Pennsylvania (known as the Sterling Hills, and the highest in that part of the State), are wholly under our control, and the Coal is mined and sold only by us or our Agents. The average product of the Sterling Coal, per ton of 2,000 lbs., is 8,733 feet of 15 ½ candle Gas (4, 37-100 per lb.), and 37 bushels of Coke of very superior quality. Getting our Coal to this place by railroad, a supply can be had during the summer months (as well as at all other times), which is not the case with coals dependent upon high water for transportation, as are most or all other gas coals which are sent to the Lake ports for shipment. Our mining facilities are such, that we are prepared to ship extensively. For any further information address the undersigned, or M. BALLARD, Esq., Syracuse, N. Y., who is our Agent for that State.

BUTTS & KENDALL, Cleveland, O.

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MANUFACTURERS OF

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MANUFACTORIES,

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STORE, 710 CHESTNUT STREET,

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JOHN HEARN & CO., Dealers and Miners in AMERICAN GAS-COALS, Erie, Penn., would call the attention of Gas Companies to the superior quality of our Coals. For the past ten years they have been used by a majority of the Gas Companies in the State of New York, west of Albany and Troy. And also, by the Gas Companies in the cities and towns of the North-Western States, and, during the past year, by the East Troy Gas-Light Company, Albany Gas-Light Co., and Manhattan Gas-Light Co. of the city of New-York, —all of which heretofore used English Coals.

Owning our mines and a fleet of vessels on the Lakes, having no Railroad transportation, and only 70 miles of canal from this city, or 140 miles of canal and Lake from Buffalo to the coal fields, being 175 miles less of transportation for Coal to the Seaboard, than any Coal Depot on the Lakes and having an Agency in Buffalo for the transhipment of our Coals only, it is unnecessary to say that parties purchasing of us, will get their Coal at first hand, saving, thereby, commission to managers and 175 miles of extra railroad and lake transportation.

A working average of our Beaver Coal is 9,500 feet of 16 Candle Gas, and 40 bushels Coal to the ton of 2,240 lbs.

The Manhattan Gas-Light Co of New York having thoroughly tested the Gas Coals of Pennsylvania and Ohio, the following extract from a letter to us will speak for itself:

"MANHATTAN GAS-LIGHT COMPANY,
"New York, June 15th, 1859.

"MESSRS. JOHN HEARN & CO., Erie, Penn. :

"GENTLEMEN,—This Company has a contract with your firm for the delivery of five thousand tons of Gas Coal, half each Beaver and Mount Carbon, at $ —— per ton of 2,240 lbs.

"The cargo which has been received is satisfactory, and as we shall need 15 or 20 thousand tons more, to be delivered through the present summer, we beg you to advise us whether you desire to increase your contract. We have applications from various parties who desire to supply the Company, but shall be satisfied to get a larger quantity of your Coals, provided you can serve us on terms equally favorable with others.

"For the Gas Co.
"HENRY YOUNG."

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GAS-COAL.—PENN COAL CO.—The Penn Coal Company having completed arrangements for mining and shipping coal on an extensive scale, are now prepared to receive orders. The mines are favorably located on the line of the Pennsylvania Railroad, 26 miles east of Pittsburgh, Pa. The coal has been tested by many gas works, and the highest testimonials will be furnished. Communications addressed to Mr. A. L. Massey, Philadelphia, will have immediate attention

ANTHRACITE AND BITUMINOUS Coal.—We are now prepared to contract with Dealers and Manufacturers, at wholesale only, for the choicest varities of Lehigh and Schuylkill Coals, Pure Locust Mountain direct from the miners' hands, George's Creek Coal from Hampshire Mines at Baltimore, and Midland Co.'s Mines at Alexandria, unexcelled for Blacksmiths', Locomotive and Manufacturing purposes. At Elizabethport, N. J., we always have a full supply of Lehigh, Spring Mountain, Hazleton and Council Ridge Coals.

LEWIS AUDENRIED & CO., 110 Broadway,
86 State street, Boston,
205 Walnut street, Philadelphia.

TO BUILDERS OF GAS WORKS.—A valuable Corporation Grant for a Gas-Works, in a flourishing City in the State of Ohio, for sale. For particulars apply to
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111 East 18th street, New-York City.

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INVENTORS' DEPOT & SALES Room for Patent Rights.—Parties desirous of placing with us valuable Patents, for the sale of Rights, on commission, will here find the Head-Quarters for Inventors and their Patents, as well as for parties seeking investments in articles of undoubted merit. The public are invited to call, or send for Circulars. New articles coming in daily. BUTLER, HOSFORD & CO.,
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REFERENCES :
CHARLES ROOME, Esq., Pres. Man. Gas Co., N. Y.
J. K. BRICK, Esq., Eng'r Brooklyn Gas Co., "
Messrs. ELLIMAN BROTHERS, New-York.
F. T. WILLIS, Esq., Pres. Savannah Gas Co.
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This is the only TUBING that perfectly resists the action of coal gas. It is made of all sizes, from ⅛ inch up to 1½ inches, and in 60 feet lengths. The measure is always external diameter, to connect the usual metal fittings.

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REFERENCES:—Gas-Light Works, Buffalo, N. Y.
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" " Chicago, Ill.
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See Engravings in AMERICAN GAS-LIGHT JOURNAL for July 1, 1860, page 280.

KENNEDY'S Method of Securing Iron Mouth Pieces to Clay Retorts—The Retort is made in the usual form, but without any bolt-holes through the flange. An iron collar made in two pieces, is then placed around the Retort behind the flange, and bolted to the mouth-piece by bolts which pass just outside of the flange instead of passing through it. As each Retort costs about $30, and as the breaking out of the bolt-holes entirely ruins the whole Retort, the importance of this simple but valuable improvement will be readily appreciated.

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HERRING & FLOYD, proprietors, manufacture Gas Compensators of all sizes, Self-Acting Valves, Exhausters upon an improved plan, costing less than half those of English manufacture, also castings of every description for Gas and Water Works.

Herring & Floyd offer for sale Sabbaton's Patent Screening Shovels for coke and coals, made of malleable iron, of all sizes; Sabbaton's Patent Improved Cast Iron Furnace Frame and Door, arranged to protect the iron work of the door and frame from direct contact with the fire; also Floyd's Patent Malleable Iron Retort Covers, only quarter of an inch thick, but of convex form, and of great strength, as is attested by certificates from several of the leading Gas-works in America. For engravings of all the above patents see AMERICAN GAS LIGHT JOURNAL for October, 1859, pages 65 and 71.

Samples of the above castings can be seen at the Rooms of the AMERICAN GAS-LIGHT JOURNAL.

S. V. MERRICK, J. VAUGHAN MERRICK,
W. H. MERRICK.
SOUTHWARK FOUNDRY, Philadelphia.
MERRICK & SONS, Engineers, manufacturers of every description of Gas Machinery.
Retorts, Bench Castings, Condensers, Washers, Scrubbers, Wet or Dry Lime Purifiers, Coke Wagons, Fire Tools, Wrought Iron Grate Bars, Gasholders, either TELESCOPIC OR SINGLE, WITH SUSPENSION FRAMES COMPLETE; Wrought Iron Roof Frames, for Iron or Slate; Stop Cocks, Exhausters, Steam Pumps, Boilers and Tanks, Steam or Hand Air Pumps for proving Street Mains, Centre Seals, Governors, Wrought or Cast-Iron Lime Sieves for Purifiers, Purifier Hoisting Machines, &c., &c.
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HUNTER, KELLER & CO., Manufacturers of
WROUGHT-IRON PIPES, AND FIXTURES
of all descriptions, for
STEAM, WATER AND GAS,
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TRANER & MERCER, 117 North Water street, and 124 North wharves, Philadelphia, AGENTS FOR FLORENCE & MERCER FOUNDRIES, ELK STREE IRON WORKS.
CAST IRON STREET MAINS; *Bends, Branches, Chemical Retorts, and all kinds of Castings for* GAS-WORKS, either COAL or ROSIN WORKS. SHEET IRON FOR GASOMETERS *cut and punched to order.* BOILER IRON *of all descriptions.* RUSSIA SHEET IRON, TIN PLATES, BLOCK TIN, COPPER, PIG LEAD, SPELTER, and Metals generally.

GEORGE W. KRAFT, GASOMETER and Boiler-maker, Chestnut st. wharf, West Philadelphia, manufactures Gasometers, Retort House Roofs, Water Tanks Purifying Boxes, Coal Cars Coke Barrows, and all kinds of Wrought Iron Work for Bridges, Buildings, &c.
Particular attention paid to Alterations and Repairs.
REFERENCES:
John C. Cresson, Engineer Gas Works, Philadelphia; Joseph A. Sabbaton, Engineer Manhattan Gas Works, New York; Col W. S. Campbell, Engineer Gas Works New Orleans; P. A. Sabbaton, Engineer Gas Works, Albany; Waterhouse and Bowes, Gas Engineers, Raleigh, N. C.; Joseph Battin, Newark N. J.; C. B. Dungan, Philadelphia.

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Of Wrought or Cast Iron, screwed together, flush inside and out; Gas-works Castings, Retorts and Bench Castings for Coal gas works; Cast Iron Street Mains, Bends, Branches, Drips, &c.
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TO GAS AND WATER COMPANIES:
The undersigned, Agent for Messrs. Thomas Edington & Sons, Phenix Foundry, Glasgow, Scotland, is prepared to contract for all descriptions of Cast-iron Pipes of their manufacture.
About 6000 tons of these Pipes have lately been supplied to the Brooklyn Water-works, N. Y., and the Chief Engineer of the Works, A. P. Kirkwood, Esq., is ready to testify to their excellent quality.
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HENRY G. NICHOLS, 24 Pine Street, up stairs, Room No. 5, New York. Manufacturers' Agent for the Sale of Cast Iron Pipe, Bends and Branches for Gas or Water, Retorts, Lamp-Posts, Lanterns for Gas Lamp-Posts.

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PIPE, PIPE, PIPE, PIPE, PIPE.—Plumbers, and all others who use Cast-Iron Drain Pipe, will do well to call at the Pipe Foundry, 39 Greene street. A large lot of Five and Six Inch, Seven Foot length, on hand, and for sale low. A. & E. B. BRADY.

WATERHOUSE & BOWES, Builders of Gas-Works, Raleigh, N. C.—Gas-Works erected in any part of the United States.
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J. H. Carson,	Pres't, Charlotte,	N. C. Gas-W'ks.	
D. G. Fowle,	do.	Raleigh	do. do.
J. C Smythe,	do.	Salisbury	do. do
Arch. McClean,	do.	Fayetteville	do. do.
Jos. A. Waddell,	do.	Staunton	Va. do.
A. G. Story,	do.	Little Falls	N. Y. do.
G. H. Young, Prop'r		Waverley	Miss. do.

Wm. Johnston, President of Charlotte & S. C. R. R., Charlotte, N. C., A. B. Wood, Agent Reading Iron Works. 57 Maiden lane, N. Y., Cornelius & Baker Manufacturers of Gas-fixtures, Philadelphia.
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Gold, Silver and Steel Spectacles; Barometers, Thermometers, Surveying Compasses, Theodolites, Levelling Instruments, Opera Glasses, Telescopes and Microscopes; Air Pumps and Electrical Machines. Instruments and Spectacles repaired. Periscopic Glasses and Pebbles.
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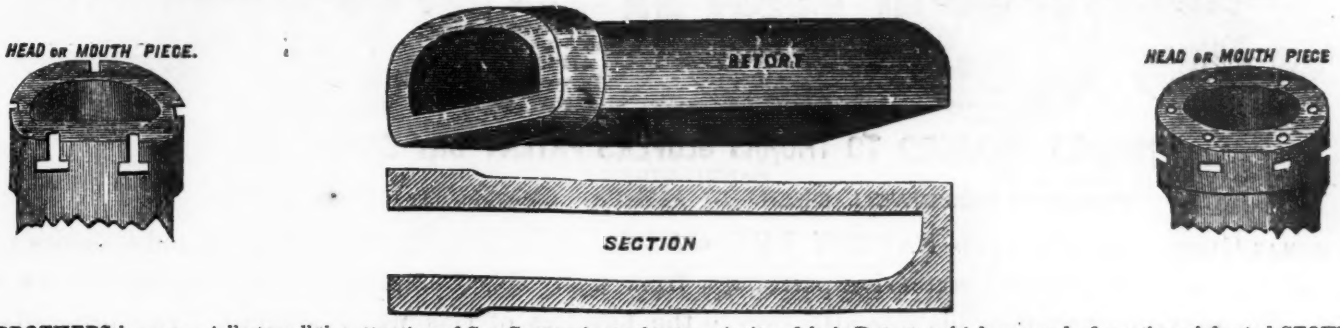
PORTABLE GAS WORKS.—S. T. McDOUGALL'S PATENT Portable Gas Works, for making Gas from Rosin, Rosin Oil, Coal Oil, Naptha, Grease, etc. These Works combine the latest improvements in gas making and are guaranteed to be superior to any in market. They are made of all sizes, suitable for either country or city use. No county house is complete without its Gas Works. Gas Stoves of every description on hand and made to order. For sale by S. T. McDougall, 170 Center Street, New York.
Agents wanted in other cities to sell rights or machines.

GAS-LIGHT STOCKS FOR SALE. THREE HUNDRED THOUSAND DOLLARS of Stocks in various Gas-light Companies in the United States, paying from 6 to 12 per cent. dividend, for sale by JOHN R. MURRAY, Rooms of the AMERICAN GAS-LIGHT JOURNAL, N. Y.

KING BROTHERS,

STOURBRIDGE, ENGLAND, FIRE-BRICK AND RETORT WORKS.



KING BROTHERS beg especially to call the attention of Gas Companies to the superiority of their Retorts, which are made from the celebrated STOURBRIDGE FIRE-CLAY. Mr. King has patented a Kiln for Burning Retorts, by which Patent all Cold Air is excluded from the Kiln while burning, thus rendering them

FREE FROM CRACKS AND CORRECT IN FORM.

By great care in Manufacturing, combined with the advantages in burning, a VERY SMOOTH SURFACE is obtained, rendering them less liable to carbonize

RETORT OVENS, FIRE-BRICKS, GUARDS, SADDLES, RABBITTED BURS, FLUES, AND QUARRIES, ARE ALL MANUFACTURED OF THE SAME QUALITY OF CLAY.

EVERY RETORT AND BRICK IS BRANDED "KING BROTHERS, STOURBRIDGE."

GEORGE WRIGHT & CO.'S

LIVERPOOL AND NEWCASTLE CANNEL AND COAL

FOR GAS MANUFACTURE AND HOUSE USE.

THE undersigned does not submit for comparison the result of chemical analysis, as this plan is too often adopted to promote the sale of inferior or worthless coals that in practice bear no particle of resemblance to their theoretical, and sometimes distorted descriptions.

He is authorized, however, to guarantee the *careful shipment of the best qualities of Cannel and Coal, at the lowest rates of Invoice and Freight offered at time of engagement;* and any losses sustained by short weight, or the neglect of the conditions mentioned, will be promptly and cheerfully repaired.

OFFICE OF THE MANHATTAN GAS-LIGHT COMPANY,
New-York, October 8th, 1859.

Messrs. GEORGE WRIGHT & Co., Liverpool:

Gentlemen,—For many years you have acted as agents for this company, purchasing for, and forwarding to them, coals, retorts, and other gas apparatus.

Your experience, ability and sterling integrity, entitle you to and have secured our confidence, and we cheerfully recommend your house to all gas companies desiring the services of an agent in England. My own personal knowledge of the superior quality of the coals within your control, and my acquaintance with the manufacturers of such articles as can be advantageously procured by you in England for gas companies abroad, added to my high regard for you personally, induce me to write this letter, and express the hope that you may be able to extend your business in this country, not only for your own advantage, but also for the benefit of those who may confide in you as securely as we have done.

I am, gentlemen, your very obedient servant,

CHARLES ROOME, *President.*

T. W. PARMELE, Agent,
No. 4 Irving Place, New-York,
GAS-EXHAUSTERS,
GOVERNORS, FURNACE DOORS,
RETORT COVERS, CASTINGS,
IMPLEMENTS,
PHOTOMETRICAL AND METER-PROVING APPARATUS.

HARRIS & PEARSON,

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BEST GLASS-HOUSE POT, AND CRUCIBLE CLAY.

Manufacturers of Fire-Bricks, Gas-Retorts, and Glass-House Furnace-Bricks of every description.

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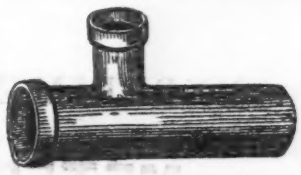
GAS, STEAM, SMOKE, PURE WATER AND SOIL PIPE,

CLAY RETORTS, TILES, BRICKS,

AND EVERY VARIETY OF FIRE GOODS.



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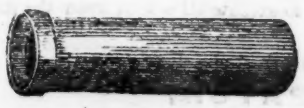
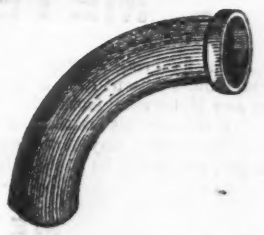




MEDALS AWARDED TO THOMAS GLOVER'S PATENT DRY GAS-METERS.

MANUFACTORIES

SUFFOCK ST. CLERKENWELL GREEN. & ALLEN ST. GOSWELL ST. LONDON.

THOMAS GLOVER introduced his PATENT DRY GAS METERS into the United States and Canadas in 1846, and since that time he has received extensive patronage from many Gas Companies of those countries as well as from this. Thomas Glover confines his sole attention to the business of Gas-Meter making. The propriety of his doing so is satisfactorily proved by his success. For example: one London Company has now in use above 12,500 of his Patent Dry Gas-Meters, and some of these Meters have been fixed for fourteen years and are still in working order, without complaint from either the company or the consumer.

THOMAS GLOVER thinks it necessary to put Gas Companies on their guard against parties selling Patent Dry Gas-Meters constructed in imitation of his, but unskilfully made on erroneous principles, and with improper and unsuitable materials.

THOMAS GLOVER'S Workshops are now the most extensive in this or any other country, and he is thereby enabled promptly to execute orders to any extent required. Purchasers may, at any time, inspect his Works and the materials of which his Meters are constructed.

Suffolk Street, Clerkenwell, London, and 1 Parrett Street, Fulton Street, Boston.

SAMUEL DOWN,

Nos. 340, 342, 344, and 346 West Twenty-second Street, North River, NEW YORK CITY,

MANUFACTURER OF

WET AND DRY PATENT GAS METERS,

Pressure-Registers, Pressure-Indicators and Gauges, Station, Show, Customer, and Experimental Gas-Meters, Centre or Hydraulic Valves, Governors, Compensators for Exhausters, and the Standard Testing Gas-Holders* for Proving Meters, now used in the State of New York in compliance with an Act of the Legislature. Also, Bunsen's Photometer, with complete Apparatus for working the same.

*The standard of measurement of this Gas-Holder is given by Professors TORREY, of the U. S. Assay Office; JOY, of Columbia College; GIBBS, of the Free Academy and several other distinguished scientific gentlemen.

JOSEPH LENNIG & CO.,

Nos. 313 and 315 NEW MARKET STREET, above Vine Street,

PHILADELPHIA, PENN.,

MANUFACTURERS OF

WET AND DRY PATENT **GAS-METERS,** STATION, SHOW, CUSTOMER, AND EXPERIMENTAL **METERS,**

PHOTOMETERS, PRESSURE REGISTERS, **INDICATORS,** AND GUAGES, **GOVERNORS, METER PROVERS,** CENTRE SEALS, FLUID GUAGES, &c.

The flattering Testimonials we are receiving from Gas Officers, accompanied with expressions of such general satisfaction, and the fact of a tried experience for fourteen years, must present itself as a security to parties desirous of securing the most reliable Instruments. We therefore recommend our Patent Dry Gas-Meter, believing it superior to any Meter manufactured. MESSRS. J. LENNIG & Co. confine their sole attention to the business of GAS-METER making.

Our materials are the best in use; the strictest attention is given to workmanship, and we guarantee entire satisfaction to all purchasers.

Purchasers may at any time inspect our Works, and the materials of which our Meters are manufactured. We are fully prepared to execute all orders, upon the shortest notice, and it will be to the interest of parties to call upon us.

☞ **Each Meter Tested Separately by a Sworn Inspector, and Sealed when desired.** ☜

METERS REPAIRED AND FORWARDED WITH DISPATCH.

WATER-WHEEL EXPERIMENTS.

Report of Chief-engineer H. P. M. Birkenbine, to the Select Council of the city of Philadelphia :—

GENTLEMEN :—In answer to your resolution of May 31, 1860, the department would submit the following general report upon the experiments made with turbine wheels at Fairmount Works :—

The experments were made in obedience to a resolution of the Committee on Water, and by an appropriation of $500 made by councils. If a detailed report is thought desirable by your honorable body, an appropriation of $350 will be necessary to print it in pamphlet form, with the necessary diagrams and tables to make it fully intelligible and useful.

An experimental apparatus was constructed at Fairmount Works, for the purpose of testing such turbine water wheels as might be presented. The department entered reluctantly into these experiments. First, for the want of time to conduct the investigations with the care and detail which their importance demands; second, on account of the limited appropriation made to carry them out; third, the delay consequent upon the experiments in completing the plans and details of the works, and also the difficulty felt in making deductions from model experiments which would guide us in the selection of wheels of the great power required for these works. So far, however, as these experiments have been prosecuted, they have been carefully done. The tests were made simply for the purpose of ascertaining what proportion of the power employed would be utilized by the different wheels or their co-efficient of useful effect. The wheels were tested under a head and fall of 6 feet, and weights of from 500 to 1,600 pounds were raised from 14 to 25 feet.

Nineteen different wheels were tested, and 122 different experiments made with them. Several of the wheels were removed without submitting them to a public test; of these no accounts have been kept. The accompanying table exhibits the best results obtained from some of the wheels :—

NAMES.	Weight raised in pounds.	Hight raised in feet.	Cubic feet of water discharged.	Head, in feet.	Time, in seconds.	Ratio.	Date of trial.
Moore & Bartlett, Worcester, Mass.	850	25	105·72958	6	39	·8359	Oct'r 7, 1859
Reuben Rich, Salmon River, N. Y.	750	25	80 19836	6	1 33	·6132	" 20, 1859
J. Littlepage, Austin, Texas	1600	14	109·384	6·05	25	·5416	Nov. 22, 1859
J. Tyler, West Lebanon, N. H.	825	25	77·21516	6	25·5	·7123	Dec. 19, 1859
N. R. Merchant, Guilford, N. Y.	1100	25	114·356	6	32	·6412	Jan. 12, 1860
L. W. Blake, East Pepperell, Mass.	925	25	86·0·56	6	28·3	·7169	" 20, 1860
Collins, Haydock & Wildman, Troy, N. Y.	900	25	78·309	6	27·6	·7662	Feb. 9, 1860
L. Smith, Reading, Pa.	1300	22	100·75758	6	20·3	·7569	" 21, 1860
E. Geyelin, Philadelphia, Pa.	1000	25	81·19:76	6	26	·8210	" 29 1860
J. E. Stevenson, Paterson, N. J.	925	25	70·25486	6	23·6	·8777	M'ch 9. 1860
A. P. Mason, Buffalo, N. Y.	750	25	79·0548	6	27·6	·6324	" 16, 1860
Andrews & Kallbach, Bernville, Pa.	700	25	56·9294	6	18·6	·8197	" 28, 1860

Mathematical accuracy was not aimed at, but the experiments may be relied upon as practically correct. The apparatus was of the most simple character, and the arrangements such that no mathematical formula was required to ascertain the amount of water used, or result produced; but they were actually weighed and measured.

It was necessary to refuse to test a number of the wheels, as the appropriation was all exhausted and the completion of the plans for the wheels could be no longer delayed, and the department was so fully occupied with the extension of the works that time could not be found to pay them the proper attention.

Valuable assistance was rendered in these experiments by the chairman of the Water Committee, O. H. P. Parker, Esq., James Millholland, of Reading, Wm. B. Bement and Charles S. Close, of this city. Among the wheels which produced the best results, and to the makers of which certificates have been given, as shown in the accompanying table, the highest co-efficients of useful results were produced by the Jonval wheels, made by J. E. Stevenson, of Paterson, N. J., and E. Geyelin, of this city, and a modification of the Parker wheel, made and patented by Andrews & Kallbach, of Bernville, in this State. The majority of the wheels worked very satisfactorily, and the makers of them were mechanics of more than ordinary ability. It is believed that no country could produce, from the same number of wheels promiscuously collected, so satisfactory a series of experiments.

The best result was procured from the Jonval wheel, made by J. E. Stevenson, of Paterson, N. J., which gave an actual useful effect of the power employed of nearly 91 per cent. The wheel of Andrews & Kallbach, of Pennsylvania, is remarkable for its simplicity; and, had it been constructed with the same amount of care and finish as that of some of the others, it is believed that the co-efficient of useful effect would not have been surpassed by any. Two of these wheels placed upon a horizontal shaft, might make a most desirable arrangement for our new works; but the department is not prepared to recommend their adoption, as it might involve a risk of a failure, and we are adverse to making any experiment at so great an expense and loss of time which might result to the city. We have been unable to find any wheels now in operation, of [illegible] aggregate power that we will require, or arranged in the above manner, or under similar circumstances to our requirements.

The department, therefore, see no reason to change the plan of the works, and will adopt the Jonval turbine, arranged and geared similar to the one now in use at Fairmount.

In coming to the above decision, and recommending the Jonval wheel, the department has been influenced by the following considerations :—

First, They have always been esteemed among the most efficient wheels, and, although other forms of wheels have been removed to give place to Jonval turbines, the department does not know an instance where the turbine wheel has been taken out to introduce another form of wheel. Our experiments upon the turbines have also proved them the most effective, giving the highest co-efficient of useful effect.

Second, They are the best adapted to our particular situation, on account of the comparatively small fall at Fairmount, and the large amount of power required for each wheel (a mean of 125-horse power,) and the low velocity they run as compared with other turbines, making less reduction of the speed necessary by means of gearing.

Third, Their durability, and the facility with which repairs and renewals can be made.

Fourth, They can be constructed and connected to the pumps at as small cost as any other form of turbine wheel. No objection can be urged against the Jonval wheel, arranged as proposed, except that involving mere mechanical arrangements, viz.: the step and bevel gearing necessary. Practically, these are not objections; the step of the present wheel at Fairmount Works has required but one renewal since it has been erected, which is the only repair found necessary to the wheel; and, as regards the bevel gearing, or reducing the velocity for the proper speed of the pumps by two or four wheels, there is only an apparent additional loss by friction, but none in reality, as a little reflection will demonstrate.

Fifth, the favorable experience the city has had with the wheel of this kind at Fairmount, built by Emile Geyelin, which has been in constant use since December, 1851.

The reasons of rejecting the plan of two wheels upon a horizontal shaft, as recommended by the former chairman of the Committee on Water, are as follows :—

First, Our minimum head and fall is but 8 feet. To produce 125-horse power by two wheels would require each of them to be 50 inches in diameter, and they would occupy so large a proportion of the head and fall that the co efficient of useful results would of necessity be low.

Second, The experiments made by the department at Fairmount, proved that two wheels arranged upon a horizontal shaft, will not give as good results as one on a verticle shaft. Two Parker wheels arranged upon this plan gave but a co-efficient of 67 per cent, while a Parker wheel by the same maker, on a vertical shaft, gave a co efficient of 75 per cent. Two Jonval wheels, upon a horizonaal shaft, gave but a co-efficient of 68 per cent. when one Jonval wheel, by the same maker, on a vertical shaft, produced a co-efficient of 82 per cent.

Third, The velocity of the wheels would be so great (from 70 to 96 revolutions per minute with the two wheels, while the one Jonval wheel upon a vertical shaft will make but from 31 to 42 revolutions per minute,) and the reduction of the speed, by means of gearing, to the speed of the pumps would therefore involve much greater loss by friction than could in possibility be the result of the plan adopted for the gearing of the Jonval wheel, as proposed.

In obedience to a resolution of the Committeee on Water, the department addressed letters to J. E. Stevenson, of Paterson, N. J.; E. Geyelin, of Philadelphia; Andrews & Kallbach, of Bernville, Pa., and Levi Smith, of Reading, Pa. In answer to these, the following propositions were received and opened by the Committee on Water, April 24th :—

From Emile Geyelin, of Philadelphia, for three turbine wheels	6,900 00
Gearing for the same	16,500 00
Total	$23,400 00
From J. E. Stevenson, of Paterson, N. J., for three turbine wheels	15,000 00
Gearing for the same	14,500 00
Total	$29,500 00
From Levi Smith, of Reading, Pa., for each turbine wheel	4,130 00
Gearing for each wheel	4,360 00
	$8,490 00
	3
Total	$25,470 00

And, at a subsequent meeting of the committee on May 22d, a proposition was received from Hunsworth, Eakin, & Co., of this city, for three turbine wheels and gearing, $26,566.80.

Care has been taken by the department not to commit the city, either in the advertisement or in letters addressed to makers of wheels, in such a manner as to give to the maker of any wheel which might be presented for test, a claim upon the city. This was done that the department might not be embarrassed in considering simply the interest of the city in selecting and constructing the wheels. In regard to the form of the wheel recommended, none of the Jonvals tested claimed any patent or peculiarity of construction, but simply differed in proportion and mechanical finish.

At the recommendation of the Committee on Water, the department has made arrangements with Emile Geyelin, of this city, to construct two Jonval turbines for the works. Respectfully yours,

HENRY P. M. BIRKENBINE, Chief-engineer.

NEW ORLEANS, LA.—The *Picayune* says: The proposed contract between the gas company of this city and the Council not having been finally decided, it may aid in coming to a proper decision to give some statistics in regard to the cost of street lighting in other cities. The same question having arisen in Chicago, a few weeks since, the gas company of that city obtained by correspondence with 248 cities and towns of the United States,* the cost to the public of maintaining their street lights. From the tables accompanying the report which condensed the facts thus obtained, we are able to make a comparison between the terms offered to the Council by our gas company and the price elsewhere paid.

It will be remembered by those who have hitherto noticed what has been hitherto published, that three propositions are made by our gas company—1st, to light the lamps 22,000 hours at $37 50 per lamp; 2d, 29,000 hours at $42 50; 3d, 38 390 hours at $50 per lamp. This furnishes the gas to the city under each proposition at $2 per thousand feet.

The cost of gas for public consumption varies in the towns from which reports have been received, with their respective distances from the coal fields, or with the cost of getting the coal used in the manufacture: but the expenses of lighting, extinguishing, keeping lamps, &c., in repair, added to the interest on the outlay, is singularly uniform. Here it is placed at $12 50 per lamp.

In seventy-eight large cities the rates at which gas is furnished are as follows: In one 78 cents per foot is charged; one $1 46; one $1 75; four $1 83; fourteen, $2; one $2 15; one $2 20; four $2 27; eight $2 40; ten $2 50; one $2 64; ten $2 75; one $2 88; eleven $3 00; one 3 10; one $3 12; one $3 25; two $3 40; four $3 50; five $4; one $4 20, making the average price for the seventy-eight towns and cities $2 76 per thousand feet. The contract proposed to our Council is seventy-six cents per thousand feet lower than this average.

In Chicago the price is $2 00; in Cleveland, $1 59; in Buffalo, $2 50; in Cincinnati, $2.

Ninety-seven towns and cities in the United States furnish gas to private consumers at $4 per 1000 feet; 11 at $4 50; 2 at $5; and 3 at $6; 124 towns and cities furnish gas to private consumers at prices ranging from $2 50 to $4.

The market for coke, the cost of buildings and pipe, and the number of consumers, besides the cost of coal, compose the elements that produce the difference in the cost of gas in different places, though, in a few instances, the character of the charters of the companies also has an influence in making up the figure. In a very few instances the gas works are owned by the corporation in part or whole, and the aim is to furnish gas at the mere cost of production.

The statistics which we have here compiled and condensed from the most reliable sources furnish conclusive evidence of the moderation of the terms proposed by our gas company.

It should be remarked that in most cities 22,000 hours is the time fixed for the burning of the public lamps durting the year; but this does not influence the cost charged per foot. We are decidedly of the opinion that it is expedient to make the experiment in this city, at least of burning them 29,000 hours, if not from sunset to dawn.

CANADA GAS STOCK.—Quebec—No buyers from the probability of the Corporation assuming the works. Montreal—None to be had. Toronto—Nothing doing.

So says the *Montreal Gazette.*

JANESVILLE, WIS.—This institution is again in default in paying the coupons of its mortgage bonds. Those due January 1 were paid after January 16; those due July 1 had not been provided for till July 18; and the agent in this city stated that the money would probably come along in about six weeks, which is the average time it takes to place $660 in New York. This is the Company that requires two Boards of Directors to manage it. We should think it would—three of them!

GAS-LIGHT IN ENGLISH RAILWAY CARRIAGES.—It is stated that the convenience of good steady light has been obtained in some of the first class carriages on the East Lancashire Railway, by the use of gas. The meter from which the gas is supplied is contained in the guard's van. It is conveyed to the roofs of the carriages and through the usual lamp-holes. There is one light in each carriage, which is sufficient to illuminate the compartment thoroughly, so that the smallest print can be read. The taps are on the roof, and cannot, therefore, be tampered with by the passengers. An iron gas-pipe passes along the roof of each carriage so lighted, and the junction between the carriages is by means of a flexible tube, with a little slack to allow of motion in the coupling and vibration from propulsion. The contrivance is very simple, and could easily be extended to a whole train. Why cannot we have the same in America?

* This information was obtained from the tables of the AMERICAN GAS-LIGHT JOURNAL for January 1860.—ED.

THE CARBURATION OF GAS.

We translate the following interesting communication from *Le Gaz*. The articles to which it refers appeared in the AMERICAN GAS-LIGHT JOURNAL for July 2, 1860.

PARIS, March 12th, 1860.

Mr. EDITOR,—May I ask you to give room in your valuable sheet, to the following remarks in answer to the articles of the 15th and 29th Feb., on the carburation of gas.

The author of the articles is wrong when he sets forth that his labors have lost their actual interest, owing to the successive abandonment of the several systems of carburetting apparatuses. Undoubtedly the excitement has subsided, and many apparatuses contrived under the pressure of an unruly competitor, have deservedly been banished from the field; but, notwithstanding, carburation has not been given up: quite the contrary, certain apparatuses are, at this very hour, the object of an application the more serious, as it takes place without display, without show, without asking of newspapers an approval or a publicity that experience alone has it in its power to bestow.

At this very moment, it is proposed to apply the system of carburation to the gas-illuminators of the new theatres, which are to be erected to take the place of those which shall be pulled down for the opening of the new *Boulevard du Prince Eugène*.

The author is indeed wrong, when he says that "the question of the carburetting apparatuses has been practically settled; and that, abandoned, one after another, they are no longer admitted in the lighting by gas."

So far as I am concerned, I can answer to this assertion, that for more than two years, my expending-carburetting apparatus has been in successful operation at the *Bazaar Européen*, *Boulevard Montmartre;* and that since the 15th of Oct., 1858, fifteen of my apparatuses, adapted to gas lanterns, have been in operation in Paris, at the dépôts of some of the most important R. R. Companies of France.

Indeed, my system of carburation has nothing in common with other apparatuses in use. All use Benzin, and it is to those that the remarks of the author of the articles apply more particularly. Whether the inventors have an answer to his charges, or how the results set forth by him agree with those of a constant practice, I know not.

As to myself, using for the carburator none but the light bits of coal, I have only to consider such passages of his paper wherein he states that, in the process of carburation, "all must depend upon the pressure and the temperature, but by no means upon the greater quantity of the liquid put in contact with the gas. The saturation, he adds, is an invariable quantity, and it is in no man's power to make it vary in its limits, according to his own wants."

Undoubtedly, both pressure and temperature fulfil an important part in the process of carburation; for, on the one hand, the less the pressure, the more has the simple gas the opportunity of becoming impregnated with the vapors of hydro-carburet; and on the other hand, the higher the temperature the more vapors are evolved by the carburetting liquid under its influence.

But, now, from the fact that the carburretting liquids are under the influence of the temperature, does it follow, I say, from that fact as a necessary consequence that the carburation of gas is complete the moment it passes through a saturated space?

In my opinion, this must depend upon the pressure and the dimensions of the saturated space; upon the pressure inasmuch that, the higher that pressure the more rapid will the passage of the gas and the less the opportunity for it to become impregnated with the carbu etting vapors. Upon the dimensions of the saturated space in this, that should that space become saturated it might happen that the solution of the vapors proved inadequate

As to the saturation of gas, it is an invariable, a fixed quantity. This is a settled fact, since in the combustion, the excess of saturation will produce smoke; but at what temperature does the saturation take place? that is the essential point the author of the articles has allowed to remain in the dark. In short, the conclusion that he comes to establish with reason:

1st. That the carburation must take place sufficiently near to the burners.

2d. That the temperature of the apparatuses through which the carburetted gas circulate, should never be below 10 degrees centigrade.

3d. That the size of the carburetting apparatus should increase in a considerable ratio with the number of burners to be supplied.

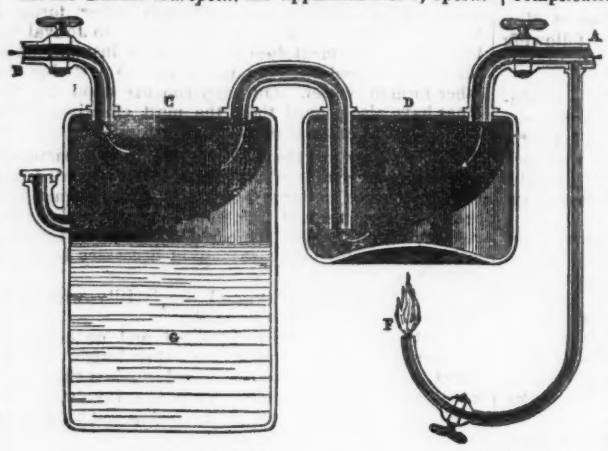
4th. That the only burners to be used for the combustion of carburetted gas are the Papillon or Manchester burners, to the exclusion of all others.

I cannot but acknowledge the accurate truth of these observations. The author, in defending them, is in perfect accordance with Mr. Ambroise Ador, who devoted many years in researches upon the best conditions in which will be produced the most complete combustion of either gases or any other combustible substances. Now, let me corroborate the evident truth of the conclusion of the author, by giving the description of my apparatuses.

In the diagrams which serve to illustrate this article, it will be observed that the gas in the three apparatuses first passes through the rarifier, D, where it becomes thoroughly heated by the flame of the burner, F, placed underneath; that afterwards it enters the carburator, C; the liquid contained in the latter is operated upon with the more energy, as the gas is the hotter; thus the gas becomes impregnated till saturation with the vapors of hydro-carburet, thence reaching the orifices of combustion.

This simple explanation will be sufficient to make it clearly understood how powerful these apparatuses must prove for a good carburation; they unite, indeed, the best mechanical and chemical conditions, and have been highly commended by all competent persons.

At the *Bazaar Européen*, the apparatus No. 1, operating upon an aggregate of 180 burners, placed at intervals on the line of the distributing pipes, yielded an illuminating power equal to 205, the power of the same number of burners with simple gas being expressed by 100.



No. 1

This result, as it is, is far from being as satisfactory as those obtained in the experiments I will mention below. This came from the premises not allowing me to use an apparatus of a size proportionate to the importance of the illumination; whence it follows that the gas, more rapid in its passage than the evolution of hydro-carburet, does not come out of the apparatus sufficiently saturated, and, consequently, does not reach its highest illuminating power. A much larger apparatus would have materially improved the operation; whence I conclude that, practically, I must obtain the same relative advantages upon the whole lighting, as I do upon a single burner; for the expansion produced by my apparatus combines the effects of carburation with those that heat exercises upon gas, previous to its combustion.

I have always so well understood the beneficial influence of temperature, that in my patent, I have anticipated the case when, in an establishment where the gas might have to circulate through long pipes exposed to a low temperature, it would become advisable to place rarifiers at intervals, in order to equalize, at every point of the lighting, the effects of the carburation. The effect of my rarifiers is so powerful that, even without the assistance of the hydro-carburet, the heat that it imparts to gas increases by 17 or 18 per cent. the illuminating power of the latter.

As to my apparatuses Nos. 2 and 3, I feel free to say that, in my most intimate conviction, there exists no apparatus as powerful to produce the carburation of gas.

No. 2

No. 3

These apparatuses present, moreover, all desirable advantages—viz.: simplicity, the absence of all mechanical complication, they require no attention, present no possible danger of an interruption in the light, and finally, with the exception of the refilling of the carburators, which may take place two or three times a month, they entail no change in the daily labor of the hands intrusted with the care of gas burners.

I will not mention here my own private experiments; I shall limit myself to record that made by persons whose names and positions must commend an entire confidence.

On the 7th of May, 1858, upon an order of the *Préfet de Police* in Paris, M. Grosjean, principal Inspector of Health, made, in the experiment room of the Police Department, with the most minute care, experiments whose results he records in a special report.

Experiment No. 1, gas expended in equal quantities.

Burner, first series, pressure 30 mill., gas expended 103 litres (quarts), intensity 100.

The same burner with carburetted gas, under the same pressure and with the same expense of gas, gave intensity 609.

Experiment No. 2, intensity of light equal.

Burner first series, pressure 30 mill.

Gas expended	100 litres.
Carburetted Gas	50 "
Gas unexpended in favor of Carburetted gas	70 "

In the months of July, August and September, 1858, the inspector of the lighting department of the Orleans Railroad Company went through a course of numerous experiments in the offices of the Company, at the dépôt, in Paris. He operated upon Papillon burners, expending 175 litres of gas. The result of his experiments, made upon light of equal intensity, gave as an average:

Simple gas expending	110 litres.
Carburetted gas expending	48 "
Economy in favor of Carburetted gas	52

Owing to these results, I was authorized to adapt 15 of my apparatuses to the burners of the gas posts on the terminus-wharf of the company, the most important point for the lighting of the city of Paris. These apparatuses have been in uninterrupted operation since the 15th of October, 1858, and all the reports made on the subject to the Board of Administration are favorable.

On the 24th and 25th of February, 1860, experiments were made in Limoges, at the mayor's office.

First experiment, equal light, pressure 30 mill.

Expended simple gas	175 litres.
Expended carburetted gas	81 "
Economy in favor of Carburetted gas	94

Second experiment at equal expense. Pressure, 30 mill.

175 litres simple gas	100
" " carburetted gas	400

Undoubtedly, when comparing these various experiments, one may be justly surprised at the discrepancies in the results; but it is well known by all competent persons that these results must vary with the burners. The more gas a burner consumes, the less powerful the effect of the carburation; whereas, this effect increases as the expense of gas diminishes: in other words, small burners are the most favorable for carburation.

I said before that I use as carburetting liquid the so-called light oils of hydro-carburett, reaching, at most, 50 centimes (about ten cents) a kilogramme (32 ounces). I calculated that the carburation of 100 cubic mètres of gas will involve an expense of 1½ kilogrammes of hydro-carburett. Rating gas at 30 centimes (6 cents), carburation will increase the cost of gas a half per cent. This proportion has been proved practically true at the depot of the Orleans Railroad at Orleans.

Now, I ask it of the author of the articles alluded to in this communication whether, in the conditions where I operate with my apparatus, carburation cannot, as an industry be turned to advantageous and profitable account. As for my part, I am satisfied that the previous expansion of gas in the rarifier contains the solution of the questions he has propounded, and that a rich harvest lies in store for this branch of industry in the conditions where I have placed it.

Begging that you will kindly excuse this lengthy disquisition, please accept, Mr. Editor, the assurance of my respect. COSTALAT.

We shall wait, before summing up this question, till other observations be elicited by the paper which is the object of the foregoing answer.

Nevertheless we should be happy to have the author solve the difficulties which we are going to propose, with a view to casting some light on the subject:

1. What is the quantity of vapors of hydro-carburet evolved under the ordinary temperature?

2. How much of those vapors can the ordinary coal-gas absorb to reach the degree of saturation?

3. What is the influence of the mixtures of the vapors of hydro-carburetts on a given quantity of coal-gas?

4. Is indeed the smoke produced by combustion a certain sign of saturation; or that of an over-expense of gas?

5. What is the influence of the evolution of the vapors of hydro-carburet on the pressure?

Everybody will understand, without any further detail for the present, the importance of the solution of the foregoing difficulties. E. D.

CORRESPONDENCE.

FLOW OF GAS THROUGH PIPES.

DALKEITH GAS WORKS, SCOTLAND, July 12, 1860.

To the Editor of the AMERICAN GAS-LIGHT JOURNAL :

SIR.—I observe, on page 223, Vol. 1, of your JOURNAL, that objection is taken by Mr. Geo. Anderson to the method of estimating the flow of gas through pipes inserted in the February number, page 152, as being the old rules formed in the first edition of Clegg.

I have not seen the edition referred to, but will take it for granted the rules are the same. Neither will I cavil with Mr. Anderson on the additional rule he seeks to introduce. The same view of the subject is taken by Mr. W. Pole, in an article to the *Journal of Gas-Lighting* in 1852, and re-published in the last edition of Clegg; but how far this principle is correct requires confirmation; that it will not apply, in the case of small pipes, is, I think, capable of proof, and there are few instances to which reference can be made as proving its accuracy in relation to large mains, but I will refer to one not unfamiliar to Mr. Anderson.

In the arbitration case of the Great Central Co. and Mr. A. A. Croll, evidence is put in by the latter that the largest consumption he found himself able to supply through a 26 inch main, with the full working pressure of the gas-holder, which was shown to be $\frac{46}{10}$ths was 175.000 cubic feet per hour. It also appears that the extreme length of the 26 inch main is about 2,700 yards from the works to a point where, to releive the draught upon it, and save the further reduction of pressure, the gas is conveyed by two mains, a 26 inch and 36 inch, to the point of supply. Now, according to the Formulae in Clegg, the quantity capable of being delivered, under such circumstances, would be 303,000 cubic feet. Thus—

$Q = 1350\ d^2 \sqrt{\frac{h\,d}{s\,l}}$ in which $\begin{cases} o = \text{quantity.} \\ l = \text{length of pipe in yds} \\ d = \text{diam. of pipe in in.} \\ h = \text{pres. in in. of water.} \\ s = \text{Sp. s. of gas air} = 1. \end{cases}$

Lel. $\begin{cases} l = 2700 \text{ yds.} \\ d = 26 \text{ inches.} \\ h = 4{\cdot}6 \\ s = 0{\cdot}4 \end{cases}$

$h = 4{\cdot}6$	Log.	$0{\cdot}662758$
$d = 26$		$1{\cdot}414973$
		$2{\cdot}077731$
$s = 0{\cdot}4$	Log.	$\overline{1}{\cdot}602060$
$l = 2700 = 3^2 \times 3 \times 100$		$3{\cdot}431364$
		$= 3{\cdot}033424$
	2	$\overline{1}{\cdot}044307$
		$\overline{1}{\cdot}522153$
$d^2 = 26^2$	Log.	$= 2{\cdot}829946$
1350		$= 3{\cdot}130334$
Cubic feet, 303.692		$= 5{\cdot}482433$*

Here, then, we have a difference of 73½ per cent. between the calculated and practical results; and as we have no reason to doubt the accuracy of Mr. Croll's evidence, it would at least appear that further proof of its accuracy would be desirable.

It may be necessary, however, to observe that a very material loss of pressure takes place upon the works. From the evidence it would appear that not more than $\frac{33}{10}$ths, initial pressure, can be put upon the 26 inch main, as it leaves the works, the difference being absorbed between the main and the gas-holder; and taking this into consideration, the discharge would, by the same formulae, be 256.000 cubic feet.

Now, I do not bring forward these particulars with any design to prove the inaccuracy of the formulae, but as they bear upon the question at issue, they are not without their importance, as conveying to us the presumption that, even in the case of large mains, it might be necessary to adopt it with some reserve. And here I would advert, in a word, to the wasteful and ruinous system which even wise and practical men may sometimes commit through a mistaken economy, in laying the pipes too small in the first instance, thereby compelling an undue pressure to be maintained for the purpose of keeping up the supply with the demand; and I think any engineer would hesitate before recommending the lowest I have named.

I have only further to say, that however highly I esteem the opinions of Mr. Anderson as worthy of attention and the utmost respect amongst gas engineers, I have no hesitation in saying that the rules I have given may be practically relied upon; they are consistent with my own experience, and assuming they do under-rate the discharge in the case of large mains, the difference will be on the side of prudence and ultimate economy. And in the case of small mains I have reason to believe that should the additional rule be at all applicable, it is, certainly, not appreciable. OBSERVATOR.

* These results are brought out nearly similar in the following way, viz.:

$$\frac{4{\cdot}6 \times 26 = 119{\cdot}6}{2700 + 26 \times 0{\cdot}4} = 9{\cdot}117 = v^2$$

$$\text{And } \frac{676 \times 1350}{3} = 304{,}200 \text{ cubic feet.}$$

THE GAS ENGINE.

INVENTED BY M. LENOIR OF PARIS, FRANCE.

Translated from the French description of Moessenet, Engineer of Mines, by Prof. Charles T. Jackson, State Assayer, Boston, Mass.

To the Editor of the AMERICAN GAS-LIGHT JOURNAL :

I have received in a letter from M. Moessenet, of the Imperial school of Mines, the following description of Lenoir's new gas engine, which is at this time attracting much attention in Paris, and which he requests me to lay before some scientific society. Thinking it appropriate to the AMERICAN GAS-LIGHT JOURNAL, I give as literal a translation as possible, and though a little obscure in some parts, it may interest your mechanical friends, and open a new escape-valve for gas. The machine is estimated at four horse power. It has a horizontal cylinder, similar to those of a steam engine.

	Metres.	Centimetres.
The diameter of the piston is	0	19
Stroke of the piston	0	30

The piston is metallic.

In the casting is formed an envelope, which is traversed by a current of cold water, (analogous to the envelope of a steam cylinder, but destined for an opposite effect, as rather serving to maintain the temperature of the metal near 130° centigrade.)

On each side is a slide valve—one for the admission of gas, which enters alternately at each extremity of the cylinder, the other for the admission of the products of combustion. These slide-valves are moved by two eccentrics, fixed (*calés*) on the axis (*l'arbre.*) The opening of the valves (*l'ouverture des lumières*) is 8 *centimètres* =3½ inches in height, and 11 *millimètres*=½ inch wide. A heavy fly-wheel, 2 metres (=6 feet) in diameter, weighing 307 kilogrammes (=600 pounds) is considered necessary.

The gas consumed is the common illuminating coal gas of the city of Paris. It is brought to the slide valve by means of a tube, and traverses a plate pierced with six or nine holes of 1¼ inches in diameter, and is divided thus into small streams or currents (*filets*)

The pressure is very slight; that of a common burner used for light. The air penetrates freely behind the slide, by means of a vertical hole made in casting the cylinder. It comes in with the gas, and is drawn in (*aspiré*) with it at each stroke of the piston.

ELECTRICAL SPARK.

An apparatus of *Ruhmkorff* produces a rapid and continual series of electrical sparks during the whole time necessary for the combustion. For this purpose, the whole of the engine is connected with the negative pole of the battery; an *electric distributor*, moved by an eccentric, closes the circuit alternately and at the proper times, first at A, and then with just such an apparatus as the other end of the cylinder.

MOTION.

Let us consider the machine in action: the piston at the end of its course, the fly-wheel drawing in an opposite direction; the fluids (mixed gases?) gas and air are drawn in behind it (the piston); this is a dead point quite prolonged, for the aspiration corresponds at this time to one-third of the stroke.

The gas is regulated by a stop-cock, either opened by hand, or connected with a *ball governor*. The *compliment* of a vacuum produced and filled by atmospheric air. After one third of the stroke, the slide closes, the entrance of the fluids (gases?) and the electrical sparks commences, and continues almost to the end of the stroke.

The physical fact on which this invention appears to rest is the mixture of gas and air not being intimate but presenting, without doubt, succe-sive portions (*présentant sans double des tranches successives*) which inflame progressively without explosion or deterioration. (A sort of flaming engine.—C. T. J.)

ACTUAL WORK.

It gives 80 revolutions per minute of rapidity of 0 m. 80 centimètres, or 2 feet 8 inches per second for the piston, on a volume of the aspired gases equal to 100 parts, or admitting five to six parts gas. The maximum of gas is 10 per cent. The temperature of the discharged gas is maintained at 120° or 130° centigrade, or 248° to 266° Fahr. Tallow is employed for greasing the machine.

No experiments have been made on the pressure and its variations during the motion of the piston. The machine gives motion to three or four tools (*outils*), fitting shops' tools, and its force is not known certainly. M. Lenoir shows the consumption of *half cubic mètre, eighteen cubic feet of gas, per horse power per hour. This quantity of gas in Paris costs* 6 *cents* or 0·30 *francs.*

OBSERVATIONS.

The details which precede, permit me to judge, criticize and appreciate the qualities and defects of the apparatus. It is superfluous to say that the machine cannot put itself in motion. On the other hand, the necessity of cooling the cylinder to prevent the heating of the cast-iron, the high temperature at which the gas is discharged after combustion, are proofs of imperfect utilization of the heat developed. Nevertheless, the *principle appears to be fruitful.* In a few months we shall know more certainly concerning the practical usefulness of these machines. CHARLES T. JACKSON, M.D.,

BOSTON, July 15th, 1860. *State Assayer.*

THE GAS ENGINE.

To the Editor of the AMERICAN GAS-LIGHT JOURNAL.

M. Lenoir of Paris has succeeded in making a machine somewhat resembling an ordinary steam-engine, but its motive power is obtained by the combustion of ordinary illuminating gas mixed with atmospheric air. In certain proportions this gas is explosive, as gas engineers well know. But in Lenoir's machine, the detonating proportion of two volumes of gas to one of air is avoided, and the highest combination allowed is one of gas to nine of air. Besides, the two are not brought into contact till they have entered the cylinder. Hence the process of combustion, which takes place after their introduction into that vessel, is not an instantaneous deflagration of the whole mass, but a gradual combination of each atom of air with the surrounding atoms of carburetted hydrogen. It is also worthy of remark that the force of this machine is not generated by any vacuum the result of combustion, but is due solely to the expansion by heat of the air, which is in excess, and of the new gaseous products then evolved. The saving effected by this machine of course depends on the price of gas. Some enterprising French chemists are expecting to produce a rich, suitable article at a cost of less than 90 cents per thousand cubic feet. At this price, M. Isoard is under a contract to produce 350,000 to 1,500,000 cubic feet a day, in the large establishment of Panis & Co. at Rueille. A machinist of Cateau is confident of being able to produce in the lower part of Lenoir's machine as much as may be wanted of a carburetted gas, which, though perhaps improper for giving light, is very suitable for heating purposes, or for combustion with atmospheric air in the interior of the cylinder. The machines can be made various sizes, and are said to consume every hour about 50 centimètres of gas for each horse power. M. Marinoni is at present constructing two of these machines, one of 6, the other of 20 horse power.

LONDON, July 14, 1860. W. R.

LAW OF THE STATE OF NEW YORK RELATIVE TO CHARGES FOR GAS-METERS.

From the following extract, as well as from other portions of the act in which meters are referred to, it is evident that the only remuneration contemplated for these instruments is a rent. No meter deposit is therefore, under any circumstances, justifiably demanded.

§ 9. If any person or persons supplied with gas by any such gas light company shall neglect or refuse to pay the *rent* or remuneration due for the same, or *for the meter*, pipes or fittings, let by the company, for supplying or using such gas or for ascertaining the quantity consumed as required by his or their contract with the company, or shall refuse or neglect, after being required so to do, to make the deposit in this act mentioned, and thereby authorized to be required, such company may prevent and stop the gas from entering the premises of such persons or person: and in all cases in which any such gas light company is or shall be authorized to cut off, prevent or stop the supply of gas from any premises, their officers, agents or workmen may enter into or upon any such premises, between the hours of eight o'clock in the forenoon and six o'clock in the afternoon, and separate, take and carry away any such meter, pipe, fittings or other works, whether the property of the company or not, from the mains or pipes of the company.

HARRISBURG, PA.—The *Harrisburg Telegraph* says: Allentown has thirty gas street lights, and pays $3 per thousand feet; Easton, seventy-five lights, $3 per thousand feet; Pottsville, seventy three lights, $3 30 per thousand feet; Reading, forty-three lights, $2 87 per thousand feet; Harrisburg, seventy-three lights, $2 50 per thousand feet; Lancaster, one hundred lights, $3 per thousand feet; Norristown, seventy-three lights, $2 50 per thousand feet.

To which the *Union* rejoins:

Yes, and if the city furnished the gas—as nineteen-twentieths of our citizens think should be the case—the town would be better lighted, and at a cost too of less than $1 25 per thousand feet, and our citizens could be furnished it at about $1 50. At these prices the city would derive a fair profit, taking the cost of gas as furnished by some of the Eastern works.

There is no question but that gas can be furnished at Harrisburg cheaper than at any other town or city east of the Alleghanies, taking into consideration the size of the city, and the large and good paying consumers who now use it. Then why should not the city furnish us gas as it does water? The time will come when the people will demand it.

PORTLAND, ME.—At the annual meeting of the Portland Gas-Light Company, held July 18, 1860, the following gentlemen were elected a Board of Directors: Rufus E. Wood, Ezra Carter, Jr., Thomas Cumming, Edward, H. Davies, Lemuel Cobb, C. H. Haskell. The new Board met and organised 23d July, and elected E. H. Davies, President, and James T. M. Cobb, Treasurer. After several successive ballotings in the Board of Aldermen on same evening, Alderman and Treasurer Palmer was appointed gas agent. The last vote but one stood three for William W. Thomas, and three for J. S. Palmer. It being a tie vote, the Mayor voted for Mr. Palmer.

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ISSUED SEMI-MONTHLY.

WEDNESDAY, AUGUST 1, 1860.

We publish elsewhere some account of two recent discoveries of which the European scientific journals are just now discussing the merits with some animation. The first is the use of magnesium as an illuminating agent. The practical value of this invention appears to be small, as the excessively high price of the metal, and the complicated nature of the machinery regulating its distribution to the flame, will at present preclude its use, except as an ingenious contrivance, more curious than useful. The other discovery is that of the gas engine, and appears to be invested with considerable interest. If, however, in the application of this principle on a large scale, the risk of explosions and accidents can be effectually prevented, there is still an objection in the price of gas, which, in this country, cannot at present be supplied except at such a cost as to render the use of the motive power derived from it too expensive when employed instead of steam, or the other motive forces ordinarily in use. The precise cost of working these engines is just now being carefully investigated by competent French machinists. When their report reaches this country, we shall present it to our readers.

As considerable excitement has of late been awakened respecting the right of gas companies to charge for the meters used by the consumers, we print on another page an extract from the statute of 14th April, 1859, from which the lawfulness of the rent for meters is clearly proved. And when it is considered that the charge made includes the cost of keeping the meters in repair, and of replacing them when worn out, the equitable nature of such a claim is at once seen. In Europe, the custom of most of the gas companies coincides with that prevailing here. Some of our city consumers have most unaccountably been laboring under the impression that they have paid a meter-deposit as well as a meter-rent. This must be altogether a mistake on their part, for we are assured that in this city not a single dollar has ever been charged or paid as a meter deposit; the whole of the me[illegible] in use, which cost upwards of half a million of dollars, being supplied by the companies, without other charge than the rent referred to in the statute.

Regarding the deposits held as a security for the prompt payment of the monthly gas bills, the law is equally explicit, and the right of the companies equally indisputable and clear. The extracts given in our last issue prove this beyond question. And as the gas-light companies are required to pay a high rate of interest on all such deposits, they are effectually prevented from exacting them except from that portion of the consumers who belong to the floating population, and from whom the only security for obtaining payment at all is to require it in advance. Hence, from five-sixths of the consumers no deposit at all is required. Since all other manufacturers are allowed to choose whom they will trust, we do not see why gas companies should not enjoy the same right.

The telegraph announces that a brilliant exhibition of water-gas was made at the Girard House, Philadelphia, on Monday evening, July 30. Half of the hotel was lighted by the water-gas, at an expense stated to not exceed fifty cents per 1000 cubic feet. The other part of the hotel was probably not detached from the city gas pipes, lest an accident should occur, in which case there would be delay in renewing the connection. We understand that arrangements have been made by the Keystone Gas Company of Philadelphia to light up two or three public buildings in this city with the water-gas.

In our last issue, on page 26, a letter from Mr. JOHN JOHNSON was presented to our readers, suggesting the propriety of writing a history of the Dry gas-meter, the earlier inventions and improvements of this valuable instrument being involved somewhat in obscurity. Mr. JOHNSON has peculiar facilities for this work, and we cordially commend his suggestions to those interested. The history of the Wet gas-meter was published some years ago in England, while the necessary information and data relative to the history of the dry meter is possessed, we believe, solely by our correspondent. We shall be happy to hear from the meter-makers of England and America, and will cause any subscriptions or suggestions that may be forwarded to us for this purpose to be properly applied.

The Metropolitan Gas-Light Company having passed successfully through the various phases of a legal examination as to the validity of their charter, announce the opening of their books for subscriptions to $380,000—being about one-third of their paid-up capital—for the purpose of interesting gas consumers in the result of their business.

The Manhattan Gas-Light Company have referred to a Committee the question of reducing the price of gas. This subject is being agitated throughout the Union, and in several cities it has been already consummated.

The attention of gas officers is directed to the advertisement of Mr. RUSSELL, who announces that he has a patent for a method of consuming tar as fuel. It is well worth looking into.

Inventors are reminded that patents are taken out at the Rooms of the AMERICAN GAS-LIGHT JOURNAL in this and all other countries where patent laws are in force. Interference cases and rejected applications are also carefully attended to by Mr. TREADWELL, our efficient Patent Agent.

The various Tables printed in our last number, although copy-righted, are now at the service of the press and the public. Further Tables will soon appear, the sole ownership of which is desired only till the publication of the succeding number of this JOURNAL.

We have caused the surplus copies of the JOURNAL to be bound into Vol. I., which is now ready for distribution, price $5 bound. As there are less than 500 sets left, our readers will perceive that it is important to order them at once.

The Manhattan Gas-Light Company advertise some valuable apparatus for sale in this number of the JOURNAL, to which the attention of companies is directed. It is the custom of our city companies, when they offer second-hand apparatus to fix their ideas of price at a low figure, so that country gas companies wanting the apparatus, may get a bargain in this instance.

The gas enterprise has taken quite a start in Cuba, where several important gas-works are being built. Mr. C. R. WOODWORTH has lately returned with contracts for three gas-works.

Mr. B. M. JOHNSON advertises a valuable corporation grant for gas-works in Ohio, for sale.

The city of Philadelphia is in the market for a sum not exceeding five hundred thousand dollars, under "An ordinance to create a loan for the further extension of the Philadelphia Gas-works," as will be seen by referring to our advertising columns.

A change in the political cast of the Portland, Me., city government has led to the routing of the direction of the gas-works, "horse, foot and dragoon." The city casts 2,500 out of some 3,400 votes, and of course the city has it all its own way. NEAL DOW is probably a little (if not a great deal) too honest for the Portland Aldermen. Mr. Dow was an able and efficient officer, and was doing good service to the gas-works. It is to be hoped that he will be reinstated next year. Mr. C. D. S. GRIFFIN, the Superintendent, is the only officer of the old board retained.

The advertisement for lamp-posts for this city is not yet ready. The fact is, the "light-fingered gentry," as they are called, (New York Aldermen in yellow kids,) are too busy with the Japanese swindle to attend to business. The poor devils who go into our Common (excessively common) Council, with but two years before them to become rich in must not let slip the chance of bagging $100,000, when nothing but the beggarly interests of the city are in the way.

In the advertising columns will be found an order issued by the Secretary of War for the immediate recommencement of work on the Washington Aqueduct. From this we infer that the President has "subsided" in his hostility to the provisions of the Act indicating Capt. MEIGS as the disbursing officer of the Aqueduct appropriation.

POSTAGE ON THIS JOURNAL.

As we have not raised the price of the JOURNAL since the double issue, we allow our friends to pay the postage, which is precisely *twelve cents per annum, payable in advance.* Subscribers should see to this, or they will be obliged to pay one cent per copy if not paid in advance. We understand that, at some of the country post offices, two cents per copy, has been demanded, after the JOURNAL has been read by half the village. This is what an Esquimaux postmaster would call a *scurvy* trick.

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.—This body will hold its meeting at Newport, R. I., commencing this day. The officers of the Society are: President, Isaac Lee, Esq., of Philadelphia; vice-President, Dr. B. A. Gould, of Cambridge; general Secretary, Professor Joseph Leconte, Columbia, S. C.; Treasurer, Dr. A. L. Elwyn, of Philadelphia. Professor Henry is to deliver a discourse commemorative of the life and labors of Dr. Robert Hare. Prof. Bache will also, by appointment, give an address on the "Gulf stream," while Prof. Leidy will discuss the extinct reptilia and mammalia of North America. *Silliman's Journal* anticipates one of the most attractive and promising meetings of the Association ever held.

NOTICE.

THE ROOMS OF

THE AMERICAN GAS-LIGHT JOURNAL

ARE

OPEN AND FREE TO ALL.

Strangers and Citizens are invited to call and make themselves quite at home, at all times.

ON THE EFFECTS OF ATMOSPHERIC AIR UPON THE ILLUMINATING POWER OF COAL-GAS.

When coal gas is mixed with atmospheric air, its illuminating power is either destroyed or greatly impaired; and in order to ascertain the precise reduction of light, due to a certain percentage of atmospheric air in coal gas, the following experiments were undertaken.

The way in which atmospheric air affects the illuminating power of a gas will be best understood by examining attentively a gas flame. It appears to consist of two parts only; one of which is dark and bluish and the other luminous. But it is really surrounded by a bluish film, which is the seat of combustion. The atmospheric oxygen can evidently act only upon the surface of the gaseous body; the combustion must cease when this oxgen is spent. We have therefore a portion of gas continually ascending, which, by this film of surface combustion, is entirely protected from the action of the atmospheric oxygen, and which, if it were not heated in its upward motion to a temperature where hydrocarbon gases, being decomposed, part with their carbon, would burn like the lower portion of a gas flame, without producing any light whatever. The exlusion of oxygen is a necessary condition for the carbon to separate, and to produce light by its incandescence.

If we burn a mixture of coal-gas and atmospheric air, we extend the surface combustion into the inner portion of the flame, and prevent the decomposition of the hydrocarbon gases into their ultimate constituents, either partly or entirely, according to the amount of oxygen present. Carbonic oxide and water vapor are produced at the expense of the illuminating power of the gas.

A large supply of gas was procured, which measured at half an inch pressure, and burnt with a 15-hole Argand at the rate of five cubic feet per hour, showed as the mean of 15 observations, an illuminating power of 18·71 English standard candles, each consuming 120 grains of sperm per hour. It was mixed successively with 5, 10, 15 and 20 per cent of atmospheric air, and perfect mixtures were obtained by passing the gases repeatedly from holder to holder. If this precaution be omitted, the larger portion of the air will, in spite of the diffusive power of gases of different specific gravities, pertinaceously remain in the lower part of the holder, and lead to wrong results.

15 hole Argand Burner	Hourly consumption in cubic feet.	Observed Candle-pow'r	Difference in Candles.	Difference per cent.
100 parts Gas, no Air	5	18·71	0	0
95 " " 5 "	5	15·14	3·57	19·08
90 " " 10 "	5	11·62	7·09	37·90
85 " " 15 "	5	8·79	9·92	53·02
80 " " 20 "	5	5·64	13·07	69.86

As the hourly consumption in these experiments remained constant, the loss of light is not only to be ascribed to the increasing proportion of atmospheric air, but also to the decreasing proportion of gas; and we must make proper allowance for the latter. We insert therefore a column for the illuminating power of the consumed gas only, and give the true loss of light.

15 hole Argand Burner	Hourly consumption in cubic feet.	Candle pow'r of Gas only.	Observed Candle pow'r	Loss in Candles.	Loss per cent	Loss in cnd'le for 1 p'r cent. of atmosphe ric air.
100 parts Gas, no Air	5	18·71	18.71			
95 " " 5 "	5	17·77	15·14	2·63	14·80	0·526
90 " " 10 "	5	16·84	11·62	5·22	31·00	0·522
85 " " 15 "	5	15·90	8.79	7·11	44·72	0.474
80 " " 20 "	5	14·96	5.64	9·32	62·30	0.466

The loss of illuminating power for one per cent. of atmospheric air is nearly the same as in all these instances; and as their average is equal to 0·497 candles, it may be called *half a candle.*

It was desirable to ascertain if gases would show an equal deterioration, when burnt with a batwing burner. Gas from the street main was taken, and showed, with a batwing burner, the hourly consumption being 5 cubic feet, and the pressure 0·7 of an inch, an illuminating power of 15·66 standard candles. When mixed with ten per cent of atmospheric air, the illuminating power was 8·98 candles. Deterioration produced by the air= 9·10×15·66—8·98=5·114 candles, or 0·5114 *candles for one per cent.*

Gas from an inferior caking coal, batwing burner, 5 cubic feet per hour, 0·4 of an inch pressure, was equal to 9·48 candles. Mixed with five per cent. of atmospheric air, to 6·56 candles. Deterioration due to air, 0·95 × 9·48—6·56=2·41 candles, or 0·488 *candles for one per cent.*

The first series of experiments rendered it superfluous to try inferior gases with the Argand burner.

Gas from Boghead coal was now procured, in order to test the effect of atmospheric air upon very rich gases. Burnt with the 15-hole Argand at the rate of 2·815 cubic feet per hour, the flame showing not the least sign of smoke, its illuminating power, calculated for five cubic feet per hour, was equal to 31·22 standard candles. Mixed with 12 per cent. of atmospheric air, and burnt at the same rate, it was equal to 28·29 candles. As 88 per cent. of 31·22 candle gas should produce only 27·47 candles, the very surprising result was found, that 12 per cent. of atmospheric air had increased the illuminating power of the flame a little (0·82 candles).

Before drawing a hasty conclusion, the circumstance was taken into consideration that the gas had been kept over night in an experimental gas-holder, and had ample time and opportunity, on account of the changes in the temperature of the air, to deposit some hydrocarbons, and that the additional volume of atmospheric air might have taken them up again. The experiment was, therefore, repeated; and in order to avoid all sources of error, certainly those which might tend to increase the illuminating power, the holders were filled with fresh water, and the gas was tested immediately after, being mixed with 12 per cent. of atmospheric air. 2·60 cubic feet per hour were burnt with a perfectly bright flame, and no signs of smoking. Illuminating power calculated for 5 cubic feet per hour, equal to 33·82 candles, which, for 88 per cent. of gas, gives 29·76 candles. Taking 88 per cent. of gas, and mixing therewith 12 per cent. of air, the result is 29·80 candles, and the gain 0·04 candles.

We can account for these results only by supposing that the additional combustion going on in the body of the flame increased its temperature sufficiently to impart to the remaining particles of carbon a higher degree of incandescence, and consequently of illuminating power; its color was certainly changed faom yellow to white, and the oxygen seemed to act similarly to alcohol when mixed with oil of turpentine. By substituting an intensity burner for the Argand, the results obtained with gas from Boghead coal conform again to the old rule of half a candle.

1. *Extra Boghead coal-gas*, Scotch tip, 0·7 inch pressure:

Illuminating power calculated for 5 cubic feet, 44·12 candles.
86 83 *per cent gas*, 18·17 *per cent. air*..... 32 77 "

Loss for one per cent. of air ..... 0 42 "

2. *Boghead Coal gas*, Scotch tip, 0·7 inch pressure:

Illuminating power, calculated for 5 cubic feet, 25·67 candles.
95 per cent. gas, 5 *per cent air*, ...21·96 "

Loss for one per cent. of air,..... 0·485 candles.

The results of these experiments may be briefly summed up as follows:

1. When coal-gas is mixed with atmospheric air, its illuminating power for all five feet burners, is reduced in the proportion of half a standard candle to every per-cent. of air present, except in the case of very rich gases burnt with a 15 hole Argand.

2. One cubic foot of atmospheric air will destroy an amount of light equal to 10 English standard candles during one hour.

3. This loss being constant, the per-centage of aggregate loss will vary with the illuminating power of the gas used.

C. S.

PRICES OF GAS CHARGED BY THE MANHATTAN GAS-LIGHT COMPANY, FROM THE ORGANIZATION OF THE COMPANY TO THE PRESENT TIME.

From May	8, 1835 to March	1, 1836	$7 00
" March	1, 1836 " Oct.	1, 1838	6 00
" Oct.	1, 1838 " Dec.	4, 1838	5 00
" Dec.	4, 1838 " Jan.	1, 1839	4 50
" Jan.	1, 1839 " "	1, 1851	4 00
" "	1, 1851 " "	1, 1852	3 50
" "	1, 1852 " Oct.	1, 1856	3 00
" Oct.	1, 1856 " present	time	2 50

The subject of reducing the price is now before the Company, and has been referred to a committee who will, doubtless, recommend its reduction, to $2 25, and perhaps to $2, in a short time. The question of exacting rent of meters, will be generally mooted in this country before long, in which case, perhaps, a change in that practice will follow.

NEW ILLUMINATING AGENT.—To gas, coal oil, candles, electricity, the oxyhydrogen apparatus, and the other means in use for artificial illumination, has been recently added an entirely new agent—the white, brilliant, silver-like metal, magnesium. A recent number of the Paris *Journdl de Pharmacie* contains a summary of a paper written by M. Schmitt, the inventor of this novel method. One of its advantages is stated to be its application to photographic operations, which can be conducted by its means during the night, or in places devoid of light. The magnesium lamp is very portable, and consists of an ordinary alcohol lamp, a reel on which magnesium wire is wound, and an ingenious arrangement of self-acting machinery for unwinding the wire and presenting it to the flame. A light of 74 candle-power consumes about 2½ ounces of the wire in ten hours. Two practical difficulties beset this novel illuminating agent, independently of its cost, which at present is great. First, the wire is not easily made of the requisite uniform size; and secondly, the clockwork requires a nice adjustment to special and varying exigencies, which is rarely attainable in automatic movements.

FATAL ACCIDENT AT THE BALTIMORE MD., GAS WORKS.—Andrew Gilbert, a tinner employed in roofing a new retort at the gas works, near Spring Gardens, Baltimore, was instantly killed on Saturday afternoon by a fall. He was working near the edge of the roof, when on attempting to pass some work to a fellow laborer, his foothold gave way, and he was precipitated headforemost to the ground, a distance of 12 or 15 feet, his head striking upon some brickwork and rubbish. His neck was broken and the side of his head crushed in by the fall, the brain oozing from the ear. A physician was called, but the unfortunate man had ceased to live. The body was removed to his home, corner of Fremont and Mulberry streets, where deceased leaves a family.

GAS COALS.—Messrs. John Hearn & Co., of Erie, Pa., one of our advertisers, have just closed a contract with the Manhattan Gas Light Company for 30,000 tons of their Beaver coal. This is probably the largest contract ever made in this country by any one house in the gas-coal trade.

REPORTS OF WATER COMPANIES.

CHICAGO, ILLINOIS.

WATER COMMISSIONER'S OFFICE,
CHICAGO, ILL., July 16th, 1860.

To the Mayor and Aldermen of the City of Chicago, in Common Council assembled:

The Board of Water Commissioners present herewith a report for the six months ending June 30th last, exhibiting specially the receipts and expenditures of the Board for this period, and the present financial state of the Water Works.

Since the rendering our last semi-annual report, the Board has made no considerable additions to the works, nor are any yet determined upon, other than such lines of distributing water-pipes as shall seem to be urgently needed. We have already contracted for the delivery here of some four hundred tons of four and six inch pipes, which will provide for any needed extensions, and leave a balance on hand.

There are some additions contemplated—in particular, such as shall be necessary to increase the supply of water in the South Division, and if it is decided to make them or to prepare for them this season, the attention of your honorable body will be called to the matter in a subsequent report.

The Water Works are in good working condition, and the only important repairs thought necessary are at the pumping works—a new piston for the smaller engine and some construction—possibly an additional chimney, to carry off the smoke from the fire-rooms.

The receipts for water rents during the half year have been satisfactory. The net income for this period amounts to $62,503 33, and the interest, repairs, and operating expenses for the same time to $54,412 92.

The following statements of the resources of the works and their application, and of cash received and expended during the half year are with this report respectfully submitted.

ORRINGTON LUNT,
EDWARD HAMILTON,
BENJAMIN CARPENTER,
Board of Water Com'rs. for the City of Chicago.

Means by which the Water works have been built and operated:

Six per cent. water loan bonds (these bonds were sold at not less than their seven per cent. par value) amount issued.....	1,030 000 00
Seven per cent. Water Loan Bonds.....	42,000 00
Income received from the Water Works on water rents and assessments and profits, tapping pipes.....	544,176 08
	$1,616,176 08

How these means have been applied:

Water Works, cost July 1st, 1860.....	992,796 69
Discount on the six per cent. bonds, sold at not less than their seven per cent. par value.....	87,732 97
Operating and repairs to July 1st, 1860.....	213,087 5
Duncan, Sherman & Co. for the July 1, '60 interest and unpaid coupons of earlier date.....	32,595 00
All interest to July 1, '60, excepting above charged D. S. & Co.....	267,707 54
Water pipes on hand, July 1, 1860.....	12,887 88
Stock, machinery, tools, &c., on hand July 1, 1860...	8,451 50
Coal " " "	3.0 76
Service cocks " " "	154 97
Stop-cock boxes " " "	150 07
Office Furniture " " "	157 00
Cash in hands of Orrington Lunt, Treasurer.....	134 16
	$1,616,176 08

Statement of Monies received and expended by Board of Water Commissioners from January 1st to June 30th, 1860, inclusive:

RECEIPTS.

Water rents and assessments; water rent book $62,349 19, charged Sewerage Commissioners, and received from them $254 40.....	62,603 59
Tapping pipes; gross receipts.....	601 00
Shutting off and letting on water, and miscellaneous office receipts.....	29 91
Received of City of Chicago for award on lot 16, block 17 Duncan's add. for opening alley in block.....	210 00
Received of Sewerage Commissioners for charges and repairs of pipe.....	121 16
Sales of old iron, $38 66; broken pipe, $19 42.....	58 08
Received of sundry parties for labor and materials, changing pipe, &c.; G. & C. U. R. R. Co., $123 40; H. H. Magie, $23 69; Telegraph Co., $21 72.....	168 81
Received from sale of Insurance stock, $5, commissions selling buildings, $3 09.....	8 09
Premium received on gold and Eastern bills sold.....	20 22
	63,850 86
Add balance on hand Jan. 1, 1860.....	147 75
Total of Cash on hand, Jan. 1st, 1860; receipts, Jan. 1st to June 3d, 1860.....	$63,998 61

EXPENDITURES.

Water rents paid back by audited vouchers.....	56 18
Extending the water pipes and all extension—cash paid out.....	1,078 48
Operating expenses and repairs for the half year—cash paid out.....	16 449 13
Interest.....	33,221 67
Tapper's services; his expenses and service cocks....	570 68
Stock for increase of stop-cocks, &c., on hand, since Jan. 1, 1860.....	74 00
Stop-cock boxes for iron covers, &c., on hand, July 1, 1860.....	150 00
Bills payable; money loaned in December, 1859.....	10,000 00
William E. Mortimer, balance due from January 1...	716 25
Mahlon McEntee and John McHugh, balance due them from Jan. 1, 1860.....	1,113 69
C. Reissig & Co., balance due them Jan 1, 1860.....	434 35
	63,864 43
Add balance in Treasurer's hands, July 1, 1860.....	134 18
	$63,998 61

REPORTS OF GAS-LIGHT COMPANIES.

COLUMBIA, PA., GAS-LIGHT COMPANY.

STATEMENT OF ACCOUNTS FROM THE LEDGER.

Dr.		Cr.	
Works and construction accounts	48,919 87	Capital Stock	37,400 00
Expenses	2,470 61	Gas account, 1859	6,051 45
Discount and interest	315 78	" old bills	962 59
Profit and Loss	57 17	Mortgage Loan	5,000 00
Individual accounts due the Company	223 20	Bills Payable	2,508 44
Cash on hand	156 58	Individual accounts due by the Comp'ny.	220 73
Total	$52,143 21	Total	$52,143 21

ASSETS.

Works, including extensions, &c	48,919 87
Individual accounts due the Company	2 3 29
Cash in hands of Secretary, December 31, 1859	156 58
Total	$49,299 65

LIABILITIES.

Mortgage Loan, held by Jos. DeNegre, Sen	5,000 00
Bills payable, (sundry notes)	2,508 44
Due individuals	220 73
Total debts	7,729 17
Capital stock	37,400 00
Old gas bills collected	962 59
Net gain for 1859	3,207 89
Total	$49,299 65

CASH RECEIVED AND EXPENDED.

Dr.	
Cash received for old gas bills	962 59
" for bills rendered in 1859	6,051 45
" for old retorts sold	38 17
" for lime sold	18 00
" for discount	7 05
" proceeds of accommodation notes	1,800 00
Total	$8,877 26
Cr.	
By vouchers on hand for cash paid out	8,720 68
" Cash on hand	156 58
Total	$8,877 26

The works produced, during the year 1859, two millions one hundred and seventy-nine thousand cubic feet of gas; have carbonized, in manufacturing the same, 279 tons of coal, and used 200 bushels of lime for purifying. The maximum number of retorts in use was three; the largest daily average yield of gas, 8,481 feet; and the largest quantity from each pound of coal respectively, made for any full day's work, 4¼ feet. Five new services have been introduced, and one additional street lamp put in use during the present year, making the number of private consumers 266, and the public lamps in use, 27. There has also been an extension of 240 feet of main pipe, making total length of mains about 4 miles. Recently a small steam engine was purchased, and a well sunk upon the grounds attached to the works, both of which have proved to be good and economical investments, saving an expense of about $300 per annum which was formerly paid for water; and by means of the steam engine we are enabled, in the coldest weather, to prevent the water in the tank and purifying rooms from freezing, thus preventing any loss to the Company, from an interruption in the supply of gas. There is but one tank and gasometer attached to the works and, as an accident may, at any time occur to it, which would necessarily prevent the manufacture of the usual supply of gas, I would suggest that there be purchased sufficient ground for a tank and that a new gas-holder be constructed, which will necessitate considerable expense. I would in conclusion, suggest to the Board that hereafter the total profits of the Company be applied strictly to the liquidation of the debt, and would therefore recommend that no dividends be declared until the total indebtedness of the Company shall have been cancelled.

All of which is respectfully submitted.

A. CALDWELL, Sec'y.

OFFICE OF COLUMBIA GAS CO., Dec. 31, 1859.

PORTLAND, ME., GAS-LIGHT COMPANY.

The Directors are glad to be able to make a Report to the stockholders, of the last year's operations which they hope will be satisfactory.

There has been considerable difficulty experienced from the commencement of the Works, on account of a scarcity of water, at certain seasons of the year, but now that evil is entirely corrected, as we hope, and at very small cost to the Company. For the future, we shall have an abundant supply of water.

There have been, during the year, complaints, as usual, of an insufficient supply of gas in the lower parts of the city, during the early evening hours, and there could be no remedy for that evil, but a new and larger main. The Directors, therefore, determined to lay down a twelve-inch pipe in Commercial street, as far as Exchange street, to be connected with the entire system of mains as they now are; and they have taken much care to learn the best mode of laying this main down.

The pipe for this purpose has been advantageously purchased in New Jersey, and the greater part of it is now lying at the Company's wharf. The remainder of it, with all the necessary connections, will soon be ready for shipment.

Some of our customers have complained, as customers do everywhere that gas is used, of large gas bills, which they suppose to arise from an imperfect measurement of the meters. A great many meters have been tested during the year, and the variations have been found to be very few and small. Gas meters, accurately made, are found to be very reliable in their indications of the actual quantity of gas that passes through them.

These complaints arise partly from the inequality of elevation of the surface of the city; but mostly from want of knowledge on the part of the consumers of gas of the way to economise it, and from want of care in its use. It is necessary to maintain at the works a pressure sufficient for the lower parts of the city, and those customers who reside on the higher grounds have necessarily an additional pressure of one-tenth of an inch for every ten feet of elevation.

It therefore results, that if the pressure on the lower levels is just sufficient, that upon the higher grounds is too much for an economical consumption of the gas, and waste is inevitable, unless those who consume gas have proper regulators as governors, or exercise constant care in its use.

For the year ending June 30, 1859, the loss of gas by leaks was 21 per cent. of all the quantity manufactured. Originally, the mains were not laid sufficiently deep to be beyond the reach of frost, and this affects the joints very much. During the present season, a thorough search of the mains has been made, and a great many leaks have been stopped. The loss of gas for the last eleven months has been only 12 per cent., and for the last two months very much less than that.

The number of street lamps is now 268, last year there were 247. The quantity of main laid last year was 5544 feet, making for the whole quantity, seventeen and a half miles.

At the commencement of the year it was found that the new Gas Holder did not work satisfactorily. It would rise without difficulty for the admission of gas, but would not descend without the application of power. The makers of the Holder had insisted that the difficulty was caused by an imperfection in the Tank—which, in consequence of settling a little, was slightly out of *round* and was not perfectly *plumb* in every part. But on examination, the difficulty was believed to be that the Holder was improperly counterpoised, and the makers were required to re-adjust the weights, since which the Holder operates perfectly, and will afford sufficient storage room for gas for the probable wants of the city for many years.

During the past year, a new and very substantial coal shed has been constructed, which will afford sufficient storage room for coal for many years to come. In preparation for this shed, it was necessary to fill a considerable area of flats. A substantial sea wall was built around the Company's flats, and a large space is left within it, in which to deposit the waste and refuse matter from the retort house, which must otherwise be carried away to some other place.

The coal sheds of the Company are so convenient that the whole cost of receiving coals from the ship is only ten cents per ton.

For several years, clay retorts have been employed in Europe instead of iron. Two years ago, two benches of imported retorts were set at our works, but with indifferent success.

The subject has occupied the attention of the Directors, however, and after extensive correspondence and careful examination, they have determined fully to adopt them after our present supply of iron retorts shall be exhausted.

A few clay retorts has been ordered from a factory in Brooklyn, N. Y., and a few from Newcastle, England, both of a superior manufacture. The Directors feel confident that the change will be considered an advantageous one. These retorts are used entirely in Albany, N. Y., by the Manhattan Company in N. Y., by the Brooklyn, N. Y., Gas Light Company, and several others.

Their first cost is not so great as that of the iron retorts, and they continue in good order much longer. Considerable care has been taken to obtain all necessary information in relation to the best mode of setting and using them.

The Directors hesitated at first about adopting these retorts, as it was supposed necessary to employ an exhauster with them, which would cost about six hundred dollars a year, but they are satisfied that by an inexpensive alteration of a part of our Works, the Clay Retorts will operate perfectly without an exhauster. These retorts will arrive in season for the winter's work.

Early in this year, the Directors determined to remove the office which the Company had occupied from the beginning of its operations.

The old office was entirely insufficient for the increased business, and it was important to have an establishment where the workshop could be under the same roof with the office. This was regarded as a necessity, as there is almost hourly occasion to communicate with the hands who are employed about the mains, services, and meters. The present office is quite satisfactory, while the rent is one hundred dollars less than that which we paid before.

The report of the Treasurer will show the financial condition of the Company. The earnings have enabled the Directors to pay the current expenses, to carry $1,808 48 to the meter account, $500 to the renewal fund, and to pay a dividend of eight per cent. This large sum was carried to the meter account, because about $1,100 of meters are returned as worthless, and every year now a large amount of them will be thrown out of use, as no longer serviceable.

By order of the Directors,

NEAL DOW, *Pres.*

PORTLAND, ME., July 18, 1860.

BUFFALO, N. Y.—A spirited discussion has been going on for some time in the public prints respecting the policy of establishing a new gas company in this city. The following extracts will shadow forth the spirit in which it is conducted:

To the Editor of the Buffalo Commercial Advertiser:

As you have allowed a free discussion on this subject in your paper, without taking sides in the matter, permit me to offer a few remarks in answer to the *Express* of this morning, which paper has formally announced itself as the champion of the new Company proposed. The *Express* says the new company has sprung up "not for the purpose of harassing the old company." Now, I would, as a consumer of gas, and a fair citizen, ask the *Express* whether the price of gas now in the city of Buffalo is not as low or even lower than the average price where the facilities for coal are the same, in other cities? This being answered in the affirmative, I repeat my former question, or suggestion—If the citizens of Buffalo are supplied with a good article of gas at as fair a price as her sister cities pay, would it not be better for the prosperity of our city, if individuals having capital to invest in gas works, would encourage some of the numerous projects which now offer peculiar inducements to the capitalist, rather than lie under the imputation of endeavoring to depreciate the value of the stock of the present gas company, upon the avails of which many widows and orphans of this city now make their whole dependence. That the present company have ample works, mains, engines, &c., sufficient to supply all the gas our city may require for years to come, no one pretends to doubt. What, then, is the use of our city being the first to inaugurate the system of investing capital in building up a duplicate concern, which it is practically admitted is not required?

We have seen figures in the abstract which look very *promising*—but common sense teaches us that if in the production of the gas required for our city, the producers are to be subjected to the expense of sustaining *two* large establishments instead of one—and are probably to receive a diminished price for the product—somebody must lose money. It may be a very pleasant game for the managers, but I should pity the poor stockholder of either concern. And I repeat, I should hope, if our municipal authorities have a restraining power in the premises, that as the true friends of the old company, and of the projected one, they will pause and carefully reflect before they permit such an injudicious and evidently fatal rivalry to be commenced. It should be the province of every good citizen to foster the manufacturing establishments we have, rather than to endeavor to break them down.

GAS CONSUMER.

To which the *Express* replies as follows:

We are not disposed usually to war with anonymous correspondents on the gas or other questions, for the reason that no man ought to put into the columns of a newspaper an article which he has not the moral or physical courage to place over his own name. But as "Gas Consumer" in the *Commercial* takes us to task for advocating cheap gas, we will waive the objection which a fictitious hiding-place throws around him, and entertain him briefly. In reply to the queries of our valiant knight with visor down, we will say that the old company furnishes the city and people with a good quality of gas, and at prices as low as any other city, save Pittsburg. Admitting this, it does not at all disarm or weaken the position assumed by those who desire to embark in the same branch of business as competitors for that character of trade. It does not follow because the city has extended to this old company certain privileges that it shall enjoy a monopoly of a branch of enterprise which may be made still more serviceable to the public interest by reducing the price of this essential article of consumption under competition. We apprehend that when the cloak and mask are pulled from "Gas Consumer," he will appear as a stockholder in the old company, who does not care to have his large dividends interfered with. This is natural, and not to be censured. He does not meet the question at issue at all. We say that gas can be afforded for $2 per 1000 feet and pay the investment well. This he does not deny, but endeavors to sustain the point that because we have *one* good company, and another desires to furnish gas at 50 cents per 1000 feet less than now paid and to the city at a large reduction, it shall not be allowed to do so, because it will reduce the value of the stock of the old company.

CONNECTICUT.—Coal has not been found in sufficient abundance to be ranked with its valuable mineral productions. Dr. C. U. Shepard, reporting on the Geological Survey of Connecticut, announces this fact. Some effort had been made to obtain coal in a highly glazed plumbaginous mica slate at Sandy Hook, near Newton; but the result was unsuccessful, and the geologist recommended the abandonment of the enterprise, without delay.

The State Geologist of Massachusetts mentions some thin veins of bituminous coal in the new red sandstone of the Connecticut valley. So late as November, 1847, it was announced that a bed of coal had been discovered in the town of Ridgefield, and that measures were in progress for working it.

BATTLE CREEK, MICH.—A charter, and exclusive privileges for building gas works at this place have been obtained. Parties wishing to learn further particulars may address Mr. Horatio Eagle at these Rooms.

HISTORY OF BALLOONING.

[*Continued from p.* 198, Vol. 1, *of the* AMERICAN GAS-LIGHT JOURNAL.]

CHAPTER II.

In the *Journal des Savans*, of September 12, 1678, an account is given of one Besnier, a locksmith, of Sable, in France, who succeeded in flying with wings, consisting of four rectangular surfaces, one at the end of each of two rods passing over the shoulders of the operator. His enterprises were limited to raising himself from one height to another gradually until he reached the top of a house, whence he easily flew to another, and thence across a river. One Dante, (not Beatrice's Dante) also framed a pair of wings, with which he managed to mount high enough to break his thigh when he came down.

Professor Wise, from whose work we quote as before, has cited a letter dated Lisbon, February 10, 1709, containing the copy of an address from one Friar Bartholomew Laurence de Guzman, to the King of Portugal, representing himself as having invented a flying diligence, for carrying passengers at great speed through the upper regions. At his request the King granted the following decree, being equivalent to our Letters Patent. After reciting the invention and claim of Guzman, he adds, as a warning against infringements:

"Agreeably to the advice of my council, I order the pain of death against the transgressor; and in order to encourage the suppliant to apply himself with zeal towards improving the machine, which is capable of producing the effects mentioned by him, I also grant unto him the first professorship of mathematics in my University of Coimbra, and the first vacancy in my College of Barcelona, with the annual pension of 60,000 reals, during his life.

"The 17th day of April, 1709."

This machine resembled a bird, to be propelled by the wind passing through several tubes and swelling a sail like a parachute. In a calm it was to be driven by a bellows, aided by magnets and other impracticable appliances, being, in fact, an infringement upon Archytas' flying bird, before alluded to. There is no record however, of any trial of the case before us. Joseph Gallien, of Avignon, published a book in 1755, entitled *L'Art de Naviger dans les Airs*, in which he asserts that a bag of cloth or leather, filled with an air lighter than the atmosphere, might be used for aerial voyages; precisely the principle of hydrogen gas balloons, and we do not see why Gallien may not be properly dubbed the discoverer of ballooning. It is probable that Gallien's balloon was a paper or cloth vessel distended by a wicker frame, made to rise by heating the air within it, which is rendered probable from the fact that we hear of its ascending two hundred feet and then coming down again, as all balloons do.

At length after repeated experiments and progressive researches, the art of aerial navigation was discovered in France, in 1782, by two brothers, STEPHEN and JOSEPH MONTGOLFIER, whose attention was first drawn to the natural ascent of smoke and clouds. Stephen, the younger brother, concluded that if a light paper bag were filled with cloud or smoke it would naturally rise. Accordingly he made an oblong paper bag of forty cubic feet capacity, and with this the two brothers made their first experiment in their own chamber at Avignon, in November, 1782. At an orifice at the lower neck of the bag, they applied burning paper, which soon distended the bag, and raised it to the ceiling, much to the joy of the projectors, who next tried it in the open air, when it ascended seventy feet. Encouraged by this success, an envelop of perhaps muslin was made of six hundred cubic feet capacity and spherical shape, which on being inflated in the same manner, broke the strings which held it near the earth and rose six or seven hundred feet, coming down soon after in the vicinity.

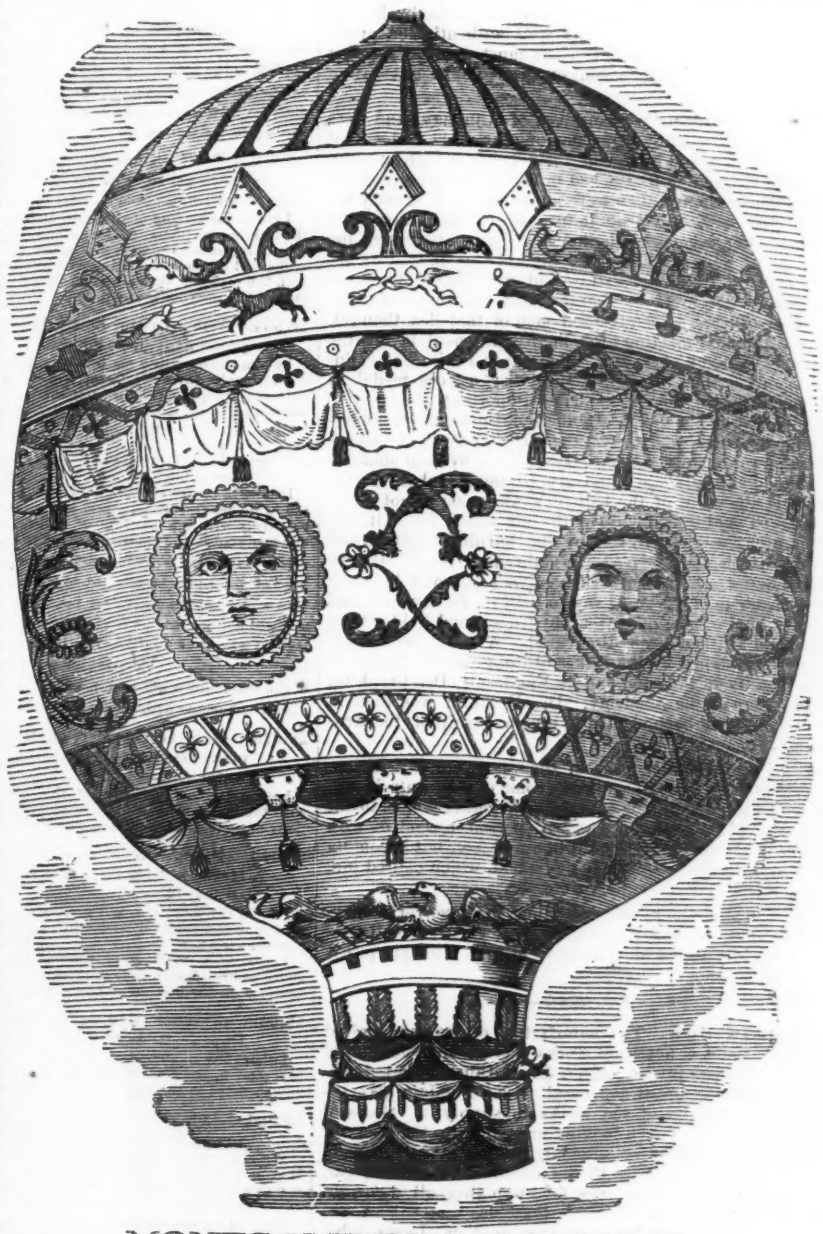
Their next attempt was a balloon, thirty-five feet in diameter, and the 3d of April, 1783, was fixed upon for the experiment, but the wind was so violent, it was deferred till the 25th of the same month, when the ascension came off in handsome style, with great appplause from those present. The balloon rose suddenly to the height of a thousand feet, and descended about three-quarters of a mile from the place of ascension. The Montgolfiers now determined to make a public experiment with this balloon, on the 5th of June, 1783, when, in consequence of general invitations, a great concourse of spectators assembled.

This balloon being as we have said, of a spherical form and thirty five feet in diameter, had a capacity of nearly 23,000 cubic feet. It was inflated over a pit or well, in which were burned chopped straw and wood, over which the orifice of the balloon was placed by swinging it from a cross rope. When fully inflated with heated air, it was found to have an ascending power of five hundred pounds, and on being released from its fastenings, it rose majestically to a height of six or seven thousand feet, and fell to the ground a mile and a half distant from its point of departure.

All Europe rang with the result of this wonderful invention, and the event is described in one of the Journals of the day, as follows:—"On Thursday, the 5th day of June, 1783, the States of Vivarais being assembled at Annonay, Messrs. Mongolfier invited them to see their new aerostatic experiment. An immense bag of linen, lined with paper, and of a shape nearly spherical, had its aperture, which was on its inferior part, attached to a frame of about sixteen feet surface, upon which it lay flaccid, like an empty bag. When this machine was inflated it measured 117 English feet in circumference; its capacity was equal to about 23,000 cubic feet, and it had been calculated that when filled with the vapor prepared for the experiment it would have lifted up about 490 pounds, besides its own weight, which together with that of the wood, was equal to 500 pounds, and this calculation was found by experiment to be pretty true. The bag was composed of several parts which were joined together by means of buttons and holes, and it is said that two men were sufficient to prepare and fill it, though eight men were required to prevent its ascension when filled." Other accounts give glowing descriptions of the experiment.

Soon after this, Stephen Montgolfier arrived in Paris. He was immediately invited to attend the sittings of the Royal Academy of Sciences, who requested him to repeat his experiment at their expense. He therefore constructed a balloon of elliptical shape, seventy-two feet high and forty-one feet in diameter, weighing, when completed, one thousand pounds. It was finished and decorated in magnificent style, and elegantly ornamented on its surface with beautiful and appropriate designs. At a preliminary experiment, it raised eight men from the ground.

On the 12th of September, 1783, the day appointed for its exhibition before the members of the Royal Academy, it ascended with a load of from four to five hundred pounds, but owing to a violent gust of wind, it was damaged in the ascent, which prevented its attaining a great height. Upon its descent it was found to be so much damaged that a new one of nearly the same dimension, was ordered to be made. To this was added a basket of wicker work. It was then inflated in the presence of the King and royal family at Versailles, and a sheep, cock, and a duck were placed in the basket. With these three animals as its passengers, it ascended about 1500 feet, and descended some three thousand yards off, with all its freight quite safe. This was the first instance in which any living creature ascended in a balloon.



MONTGOLFIER'S BALLOON.

Another was now constructed, seventy-four feet in height, forty-eight feet in diameter, with an opening at the bottom, fifteen feet in diameter. Around this opening was arranged a gallery of wicker work, three feet broad, and around the outer edge of this was a balustrade of the same material, three feet high, and around the lower circumference of the balloon and immediately above the gallery platform port-holes were worked in it for the purpose of introducing fuel. From around the lower aperture of the balloon, chains were suspended to which was fastened an iron brazier intended for the fuel place, on which the aernaut could easily introduce fuel from the port-holes as necessity required it. On the 21st of November, M. Pilatre de Rozier, in company with the Marquis d'Arlandes, concluded to make an aerial voyage. Accordingly, the balloon was inflated and the gallery supplied with fuel, whereupon they stationed themselves on opposite sides of the gallery, when, at a given signal, the balloon was loosed from its moorings and rose rapidly in the air, amid the shouts and applause of a delighted multitude, until it attained a height of 3,000 feet. The whole machine, with fuel, passengers and all, weighed 1600 pounds. During the voyage which lasted twenty-five minutes, they were several times in imminent danger by the balloon taking fire. The Marquis becoming greatly agitated, desired to make a precipitate descent, but the coolness and intrepidity of M. Rozier, avoided this danger, having provided himself with a sponge and water for the emergency, with which he extinguished the fire, enabling them to remain on high for some time longer. They raised and lowered themselves frequently during this excursion, by regulating the fire in the brazier, and finally, after sailing over a great portion of Paris, landed in safety, five miles from where they started.

The following is an extract from a letter written by the Marquis d'Arlandes to M. de St.-Fond, concerning this first aerial voyage, dated November 28th, 1783:

"We set off at fifty four minutes past one. The balloon was so placed that M. Rozier was on the west, and I on the east. The machine, says the public, rose with majesty. I think few of them saw that, at the moment when it passed the hedge, it made a half turn, and we changed our positions, which, thus altered, we retained to the end. I was astonished at the smallness of the noise or motion occasioned by our departure among the spectators; I thought they might be astonished and frightened, and might stand in need of encouragement, so I waved my arm with little success. I then drew out and shook my handkerchief, and immediately perceived a great movement in the yard. It seemed as if the spectators all formed one mass, which rushed by an involuntary motion towards the wall, which it seemed to consider as the only obstacle between us. At this moment M. de Rozier called out, 'You are doing nothing, and we do not rise.' I begged his pardon, took some straw, moved the fire, and turned again quickly; but I could not find La Muette. In astonishment, followed the river with my eye, and at last found where the Oise joined it. Here, then, was Conflans; and, naming the principal bends of the river by the places nearest to them, I repeated Poissy St. Germain, St. Denis, Sèvre; then I am still at Poissy or Chaillot. Accordingly, looking down through the car, I saw the Visitation de Chaillot. M. Pilatre said to me, at this moment, 'Here is the river, and we are descending.' 'Well, my friend,' said I, 'more fire;' and we set to work. But, instead of crossing the river, as our course towards the Invalides seemed to indicate, we went along the Ile des Cygnes, entered the principal bed again, and went up the stream till we were above the barrier La Conférence. I said to my brave associate, 'Here is a river which is very difficult to cross.' 'I think so,' said he; 'you are doing nothing.' 'I am not so strong as you,' I answered; 'and we are well as we are.' I stirred the fire, and seized a bundle of straw, which, being too much pressed, did not light well. I shook it over the flame, and the instant after I felt as if I had been seized under the arms, and said to my friend, 'We are rising now, however.' 'Yes, we are rising,' he answered, coming from the interior, where he had been seeing all was right. At this moment, I heard a noise high up in the balloon, which made me fear it had burst. I looked up, saw nothing; but, as I had my eyes fixed on the machine, I felt a shock, the first I had experience. The shock was upwards, and I cried out, 'What are you doing—are you

dancing?' 'I am not stirring.' 'So much the better,' I said; 'this must be a new current, which will, I hope, take us off the river.' Accordingly, I turned to see where we were, and found myself between the Ecole Militaire and the Invalides, which we had passed by about 400 toises. M. Pilatre said, 'We are now in the plain.' 'Yes,' I said, 'we are getting on.' 'Let us set to work,' he replied. I heard a new noise in the machine, which I thought came from the breaking of a cord. I looked in and saw that the southern part was full of round holes, several of them large. I said, 'We must get down.' 'Why?' 'Look!' said I. At the same time I took my sponge and easily extinguished the fire, which was enlarging such of the holes as I could reach; but on trying if the balloon was fast to the lower circle, I found it easily came off. I repeated to my companion, 'We must descend.' He looked around him and said, 'We are over Paris.' Having looked to the safety of the cords, I said, 'We can cross Paris.' We were now coming near the roofs; we raised the fire, and rose again with great ease. I looked under me and saw the Missions Etrangères, and it seemed as if we were going towards the towers of St. Sulpice, which I could see. Raising ourselves, a current turned us south. I saw on my left a wood, which I thought was the Luxembourg. We passed the Boulevard, and I called out, 'Pied à terre.' We stopped the fire; but the brave Pilatre, who did not lose his self-possession, thought we were coming on mills, and warned me. We alighted at the Butte aux Cailles, between the mill Des Merveilles and the Moulin Vieux. The moment we touched land, I held by the car with my two hands; I felt the balloon press my head lightly. I pushed it off, and leaped out. Turning towards the balloon, which I expected to find full, to my great astonishment it was perfectly empty and flattened."

These are the first aerial voyages made by human beings, of which we have any well authenticated proof, and to these all true historians must point as the first practical and fully successful experiments in navigating the air.

The Montgolfiers were natives of Annonay, and were the sons of a wealthy paper manufacturer who had retired from business and left it in their hands. Both of them appear to have been attached to the study of mathematical science, though they were apparently not exactly acquainted with the true nature of the substance that caused the ascent of balloons. They attributed the ascending power to a peculiar kind of gas emitted by the combustion of chopped straw and wool mixed together. This does not, however, detract from the merit of their discovery; and so the learned men of that day thought, for at the next meeting after their experiment before the Royal Academy of Arts and Science in Paris, that eminent body voted Stephen Montgolfier a gold medal in honor of having made the most important discovery of the period. That the Montgolfiers did not exactly understand the cause or nature of the material that gave ascensive power to their balloons, is evidenced by their affidavit communicating their discovery to the Royal Academy. In this, the effect of the balloon's ascension is not attributed to the rarefied state of the air which filled it, but to a peculiar gas evolved by the burning of straw and wool, which they termed "certain materials." It was, for a better name, termed *Montgolfier's Gas*, and led even the members of the Academy to believe, for a while, that a new kind of gas, other than hydrogen, and lighter than common air, had been discovered. A certificate to this effect was signed by the Dukes of Polignac and Deguines, the Counts de Polarton and de Vaudreuil, Dr. Franklin, and others of the Academy. Dr. Franklin was then in Paris, and had been elected to a membership of the Academy.

During the latter part of the same year, Dr. Rittenhouse and Mr. Hopkinson made some experiments in the city of Philadelphia, by connecting together four balloons inflated with hydrogen gas. A person ascended with them to the height of several hundred feet, but becoming alarmed, he cut a hole in one of them, which caused him to descend in double quick time.

The next chapter will introduce the discovery of hydrogen gas, as applied to aeronautics, when we shall proceed rapidly to the development of the principle to the present date.

SAGINAW, MICH.—The manufacture of gas on a limited scale at the new hotel gas works, and the introduction of it into business places, offices, &c., within a limited distance, has stimulated a general wish to obtain gas, beyond the capacity of the works to supply it. Some of the citizens have been looking around with the view of forming a company, or inducing some eastern company or individual to engage in the manufacture of coal gas, on a scale sufficiently large for supplying all demands. We learn that, with this view, there has been some negotiation with a gas manufacturer in New Jersey, who, after examining the map and obtaining information otherwise, is willing to engage in the business here, provided he can have the use of grounds free of expense. He has been offered grounds on Franklin street, but prefers Water lots, to avoid the expense of transporting coal from the docks to the works. We learn that Mr. Hoyt has proposed to furnish two lots near the foot of Miller street, and if the city will grant the lot which reverted to it in consequence of the vacation of that portion of Miller street between Water street and the river, and which cost the city nothing, it will make up the three lots required for the works, which will be erected immediately. We hope the Common Council of Saginaw will look upon the project favorably.

PATENTS.

Inventors are informed that Patents are procured at the Rooms of the AMERICAN GAS-LIGHT JOURNAL, through F. C. TREADWELL, Jr., Esq., an experienced Patent Agent and Expert.

UNITED STATES.

28,855.—E. J. Hale, of Foxcroft, Maine, for an Improvement in Lamps:

I claim so combining or arranging a tubular air guard, D, within or with the cone or deflector, C, and with respect to the wick tube, that air passing up through the cone or deflector, C, shall be caused to freely circulate not only against the sides and edges of the flame of the wick, when inflamed, but against the outer surfaces of the sides and ends of the air guard.

I also claim so combining an air guard with the cone or deflector as to be removeable with and by it, with respect to the wick tube, as set forth.

28,873.—O. L. Lawson (assignor to the New York Car and Steamboat Gas Company), of New York City, for an Improvement in Gas-holders:

I claim the reservoir, E, composed of one or more cylinders, or its equivalent, placed between the force pumps, B, and holders, K, for the purpose of facilitating the filling of said holders, substantially as set forth.

28,924.—George Walker, of Philadelphia, Pa., for an Improvement in Vapor Lamps:

I claim, first, The combination of the external shell or tube, G, with the wick or packing tube, F, and heater tube I, provided with the heater, J, and plates, c c, for the purpose set forth.

Second, The connecting of the described vapor-burning apparatus to the body of a lamp by means of a tube, D, in the manner substantially as and for the purpose set forth.

[This invention relates to a lamp for burning volatile hydro carbons by first vaporizing or gasifying the same, the illuminating flame being fed by the vapor, and the invention being capable of being applied to the ordinary fluid lamps. The invention consists in a novel arrangement of a burner, heater, wick or backing tube, an external shell, and heater tube, so constructed, arranged and applied to the fountain or body of the lamp, whereby the hydrocarbon within the lamp may be quickly vaporized or gasified, the distance between the flame and the heater regulated as desired, according to the amount or intensity of light required.]

28,942.—T. C. Simonton (assignor to De Grasse B. Fowler), of Paterson, N. J., for an Improvement in Filters:

I claim the placing of the tube, D, and the plates, B B, containing the filtering mediums, C, secured as described in the case, A, as shown, in connection with the pipes, E F G J, provided with the cocks, H I K, communicating with the case, and arranged relatively with the plates or the compartments formed thereby, to operate as and for the purpose set forth.

28,954.—Wm. Austin, of Philadelphia, Pa., for an Improvement in Attaching Water Pipes to Buildings:

I claim the described method of attaching water pipes to buildings, whereby any one joint may be removed or replaced without either injuring the wall or disturbing the remainder of the joints, the whole being constructed and operating substantially as set forth.

28,992.—James Martin, of Florence, Ala., for an Improvement in Water Wheels:

I claim in center-vent water wheels, the combination of the horizontal sluices D, vertical pipes, E E and chutes C C, when arranged relatively with the buckets of the wheel, the whole constructed and operated in the manner and for the purpose set forth.

[This invention is a novel arrangement of parts, whereby a full head of water may be brought to act on all the buckets of a center-vent wheel; at the same time the water will have a free discharge, and will not be crowded back against the bucket, as is the case with turbine wheels generally. The issue or influx of water is brought in such a relation to the buckets as to suit the different velocities of the wheel under different heads of water, and the water will act upon the buckets with greater effective force or impact.]

29,015.—G. S. G. Spencer, of Boston, Mass., for an Improvement in Apparatuses for Distilling Sea-water:

I claim the arrangement of the receptacle, B, in combination with the boiler, A, and the condenser, C, in the manner substantially as and for the purposes set forth.

29,040.—E. W. Rowe (assignor to himself and J. T. Hardy) of Brewer, Maine, for an Improvement in Drain Tiles:

I claim the tongue, c, and groove, d, arranged on opposite sides of, and in combination with, the tile, substantially as and for the purpose specified.

I also claim molding or forming the clay or plastic drain tile above described with the tenon recess and the tenon for side connections, in the manner and for the purpose set forth.

29,056.—Thomas Byrne, of Baton Rouge, La., for an Improved Method of Cooling Water:

I claim the combination of a subterranean reservoir, e, with a feed pipe, b, and a discharge pipe, a a', when constructed, arranged and operated in the manner and for the purpose set forth.

29,060.—Jacob Closs and I. N. Pyle, of Decatur, Ind., for an Improvement in Water Wheels:

We claim the arrangement of the wheel, F D, and their shafts, B b, in combination with the openings, e e, 11, and gates, m o, as shown and described, so that one or both wheels may be operated as desired—all as set forth.

[This invention relates to an improvement in horizontal water wheels, and consists in combining two wheels in such a manner that both may be used and made to operate conjointly by the action of the same volume of water in passing through both, or one of the wheels used separately, as occasion may require.]

29,069.—John Fitch, of Seneca Falls, N. Y., for an Improvement in Filters:

I claim the filter when constructed, arranged and operated in the manner and for the purposes set forth.

29,079.—Enoch Hidden, of New York City, for Improved Side Lights for Ships:

I claim the employment, on a hinged or swinging ship's light, of a spring catch bar, in combination with a locking screw or its equivalent; the two arranged to operate substantially as described, for the purposes set forth.

29,110.—J. A. C. J. Smith, of Philadelphia, Pa., for an Improvement in Pumps:

I claim the employment of the spherical shell, A, in combination with the rounded partition, E E', and rounded piston, H, as and for the purpose shown and described.

[The object of this invention is to economize in the construction of the force pump, and also to dispense with much friction attending the operation of the same. The invention consists in having the body or chamber of the pump constructed in the form of a hollow sphere, provided with inclined partitions, and a vibratory plunger or piston, which, as well as the partitions, is provided with valves.]

29,111.—Wm. Stephenson, of Galion, Ohio, for an Improvement in Gas Pipes:

I claim a wooden gas pipe, A, coated on the inside with a composition of graphite and sulphur, or its equivalents.

29,113.—Anthony Stratton, of Brooklyn, N. Y., for an Improvement in Flexible Joints for Gas Tubes:

I claim the chain C, or its equivalent, in connection with the india rubber or other flexible tube, D, applied to the sockets, A B, substantially as and for the purpose set forth.

29,118.—T. F. Woodward, of South Reading, Mass., for an Improved Signal Lantern:

I claim, first, The portable signal lantern for vessels, substantially as described, the same consisting of a lantern, or its equivalent, for producing a constant light, with which is combined an apparatus for instantaneously producing a report, or an alarm, or an intense pyrotechnic light as set forth.

Second, In combination with the igniting and discharging apparatus, the cover, n n, so operated as to be instantaneously thrown open when the contents of the barrels are ignited, and serving to protect the same from exposure to dampness, &c., as set forth.

29,124.—Erastus Crooker (assignor to himself and J. T. Upson), of Buffalo, N. Y., for an Improvement in Vapor Lamps:

I claim the arrangement of the fluid pipe, K, converging chambers, d and e, screw tops, f and g, recess, f', and gas pipe, h, as and for the purposes set forth.

29,149.—J. W, Durham of Durhamville, Tenn., for an Improved Engine for employing Steam or other Aeriform or Gaseous Body under Pressure to obtain Motive Power:

I claim an engine, composed of an endless chain of buckets arranged within a box of water, with suitable pipes or other means of ingress and egress to and from the said box; the whole being constructed, arranged and combined so as to produce an operation substantially as described.

[This invention consists of an upright endless chain of buckets, ranged within a suitable box, which is filled with water to a suitable level, and to which steam or other gaseous aeriform body, at pressure greater than the atmosphere, is introduced by a pipe or pipes in such a manner as to enter the buckets below the surface of the water, and to displace the water therefrom, and to give motion to the chain of buckets by its tendency to rise to the surface of the water.]

29,150.—Adam Ernst and C. Shepard, of Milwaukie, Wis., for an Improvement in Hot-air Furnaces:

We claim combining the flues of a furnace, surrounded by double walls, with collars, S, and covers, R U W V, substantially as and for the purposes described.

29,164.—Wm. D. Hall, of Hamden, Conn., for an Improvement in Fish Oils:

I claim, as an article of manufacture, an oil extracted from fish in the manner set forth.

29,167.—F. P. Keller and Elias Young, of Cincinnati, Ohio, for an Improvement in Air Furnaces:

We claim, first, The combination of the vertical diaphragm, c, with the drum, C, and Tubes, G and G', operating in the manner and for the purposes set forth.

Second, The arrangement of the air reservoir, E, annular air and smoke chambers, a and k, and tubes, G G' G'', operating in the manner and for the purposes explained.

29,172.—J. Y. Humphrey, of Philadelphia, Pa., for an Improved Mica Chimney for Lamps:

I claim the combination of the tapering cap b, with the mica tube, A a, and metal ring supports, c c' g g', as and for the purpose described.

29,203.—I. W. Tabor, of New Bedford, Mass., for an Improvement in Lamps:

I claim locating the independent air chamber, e, in the space between the flat wicks of said lamp, and then supplying the said chamber with air through the medium of independent induction tubes, g g, when the united flame produced by both of said wicks is made to pass up through a slit in the deflector, c, which surmounts the perforated sides, b, of the outer air chamber of said lamp—all substantially as set forth.

ADDITIONAL IMPROVEMENTS.

B. B. Briggs, of Sharon, Ohio, for an Improvement in Apparatuses for Laying Drain Tile. Patented Oct. 4, 1859:

I claim the described ball, B, the double acting clutches or fingers, F F, with its notched slide, g, and lock attachment, H, the mole attachments as in Fig. 2, when used in combination with the rope, R, or its equivalent.

RE-ISSUES.

J. P. Collins, of Troy, N. Y., for an Improved Water Wheel. Patented Dec. 6, 1859:

I claim, first The arrangement of the lighter plate, L, in the particular manner specified, and for the purpose set forth.

Second, The arrangement, in the particular manner specified, of the packing ring, i, for the purpose set forth.

Third, The arrangement, in the particular manner specified, of the lip or projecting piece, e, of the buckets, for the purpose set forth.

Fourth, The arrangement in the particular manner specified, of the regulating plate J, in combination with the peculiar specified device for operating it, for the purpose set forth.

Fifth, The employment or use of the dividing strip or ring inserted in the buckets, substantially as and for the purpose set forth.

Sixth, The fitting of the lower part of the box, G, over the annular flanch, n, of the wheel, as shown, or in an equivalent way, so as to form a joint as nearly water-tight as may be in connection with the openings, l l, in the plate d, and the oblique plates, m, and the sides of the openings, as and for the purpose set forth.

Seventh, The employment, for united use in one wheel, of the lighter plate, B, packing, i, projecting lip or flanches, e, gage or regulating plate, J, and annular dividing plate, A, the whole being constructed, arranged and operating in the manner and for the purpose set forth.

SOLID OIL IN THE SHAPE OF COAL.

We have been favored with a small specimen of coal from the neighborhood of Cairo station, Ritchie county, Virginia, on the Northwestern Virginia Railroad, which is of a peculiar quality. It has been tested by various chemists, and has been found to be as it were crystalized mineral oil—but without stratification, and free from any foreign substance. The tests have shown that it will yield ond hundred and sixty-five gallons of pure oil to the ton. By taking a portion of the coal and laying it on a hot stove or shovel, its extraordinary quality is obvious. It melts and runs like wax.—*Pittsburg Post*, July 11.

We fear our Pennsylvania and Virginia friends are getting too much excited in natural oil beds, as we Downeasters once were, respecting pine trees. And this story of solid oil reminds us of an occurrence in our State during the days of the land fever.

After most of the lands had been sold over several times, other projects were started, and among them that of finding coal along the primitive formation of our sea coast in Maine. The existence of red sandstone upon the river St. Croix led some to believe that coal might be found beneath it. and hence a company was formed "Down East," and the work of boring for coal commenced. The stock was taken up by the bulls of that day to five dollars per share, when, one Monday, in drawing up the boring apparatus, pieces of block shale were found, similar in character to those which overlie the coal formation in Pennsylvania. This indication of coal carried up the stock to ten dollars per share, and all the neighborhood was in a great ferment respecting shares in the new coal mine.

The week's work went on, but without any further indications of coal. Next Monday, however, upon drawing up the augur after boring a short time, it came up filled with *white bread and butter*. This was a little richer than the solid oil of Virginia, above named—and although, upon discovery of coal, the stock went up ten dollars per share, the "bread and butter strata" carried it down to nothing, and actually killed the company outright.

Some wag on Sunday had first dropped into the hole the pieces of shale, and next Sunday followed it up by a loaf of bread well buttered, which threw so much ridicule upon the whole project that it was abandoned.—*Portland Me., Advertiser.*

CONSOLIDATION OF THE ROCHESTER, N. Y., GAS COMPANIES.—There have been rumors for some time that the "People's Gas Light Company" were about to dispose of their interest and franchise to the "Old" Gas Light Company. These rumors were well founded, it appears; and the expectations they gave rise to have been realized. The newly-formed company have accomplished the chief ends of their organization, in securing certain concessions from the old Company, from which the "people" derive decided advantages. The price of gas is to remain at the reduced figure, two dollars and a half per thousand feet; the mains are to be extended in avenues where they have been demanded; the property purchased for the new gas works is to be taken by the old company, and the directorship is to some extent merged.

The property bought by the new company was purchased on very favorable terms, and is required for the purpose of the existing works. So far as that is concerned, the transfer is mutually advantageous. The result will be beneficial to the public, we believe; and so believing, we approve of it heartily.

SANITARY ITEMS.

SANITARY CONVENTION.—At the National Sanitary Convention recently held in Boston, Dr. Harris, of this city, read a paper on "Heat as a Disinfectant." It appears that the boiling of clothes exposed to infection had proved an efficient disinfectant. The heating of hospital wards by common stones, to 160° Fahrenheit for two days, had eradicated infection. Dr. Harris referred to his own experience in the Quarantine Hospital, and showed that the washerwomen avoided infection by boiling the clothes before washing; when this was not done, every washerwoman caught the disease. Heat applied to clothing and rooms had produced the same effects in scarlet fever and other diseases. His observation had shown that nearly all fabrics would bear a higher degree of heat than was required for complete disinfection. Dr. Arnold, of Savannah, remarked that after the yellow fever appeared in that city, no man was safe till the appearance of a strong black frost. Cold killed it. Dr. Harris mentioned a case where tons of ice failed to expel infection from a vessel. Dr. Mather agreed with Dr. Harris. Mr. Dadd, of Newark, had known a ship to be disinfected of yellow fever by steam when it was intended to kill rats. The attempt to freeze the yellow fever out of the frigate Susquehannah cost $10,000, and failed at that. Dr. Bibbins, of this city, said that he had never known a small-pox epidemic in the city during dog days. Heat killed it as effectually as cold did the yellow fever.

Mayor Lincoln submitted a communication from George B. Emerson, Esq., of Boston, calling the attention of the Convention to our system of sewerage, by which much of valuable fertilizing material is carried into the rivers and bays through imperfect sewerage, and thus lost to agriculture. The letter stated that it was estimated that every family of five persons annually created refuse matter sufficient to manure at least one acre of land. According to this one statistical fact, fertilizing material sufficient for 30,000 acres of our poor land was annually wasted in the city of Boston alone by means of a wasteful system of drainage. It was impossible at the present time to determine how much was lost to each city and town of our country from the same cause. Facts must be gathered in order to determine this question. The communication closed with a forcible argument upon the prospective importance of this subject to the interests of agriculture.

PURIFICATION OF WATER.—For the purification of foul water, Mr. Thomas Spencer, the discoverer of the electrotype, has made another important discovery. It is that the magnetic oxide of iron, which abounds in rocky strata, and in sands, &c., attracts oxygen, whether it exists in water or air, and polarizes it—that this polarized oxygen is the salubrifying ozone—that this ozone, so formed, destroys all discoloring and polluting organic solutions in water, and converts them into the sparkling and refreshing carbonic acid of the healthful spring. Even sewerage water can be thus almost instantaneously purified. Moreover, Mr. Spencer has discovered that the apparently mechanical process of filtration, is itself magnetical, and it is now known that all substances are constitutionally more or less subject to magnetical influence; thus all extraneous matters suspended in water may be rapidly attracted in filtration, and separated; and this may be done whether on a great scale or a small, either by the magnetic oxide or black sand, or by various other means; and Mr. Spencer has discovered a solid porous combination of carbon with magnetic oxide prepared from Cumberland hæmatite, which is said to have very great filtering power.

ASSESSMENTS FOR SEWERS.—Brooklyn. N. Y., Eastern District.—Public notice is hereby given that the Assessments for the expenses attending the construction of Sewers in the following named streets and parts of streets, avenues and parts of avenues, places and parts of places, have been made and completed by the Sewer Commissioners of the city of Brooklyn, viz.:

First street from South 2d street to Summit, between South 11th street and Division avenue or Broadway.

Second street from South 2d street to Summit, between South 11th street and Division avenue or Broadway.

Third street from South 2d street to Division avenue or Broadway.

Fourth street from Summit, between South 2d and South 3d streets, to Division avenue or Broadway.

Fifth street from South 3d street to Division avenue or Broadway.

Sixth street from South 8th street to Division avenue or Broadway.

Seventh street from South 9th street to Division avenue or Broadway.

Eighth street from South 9th street to Ross street.

South Second street from Summit, between Third and Fourth streets, to Second street.

South Third street from First to Fifth street.

South Fourth street from First to Fifth street.

South Fifth street from First to Fifth street.

South Sixth street from East River to Fifth street.

South Seventh street from First to South Sixth street—thence up South Sixth street to Fifth st.

South Eighth street from First to Sixth street.

South Ninth street from First to Eighth street.

South Tenth street from First to Fourth street.

South Eleventh street from First to Second st.

Division avenue or Broadway, from Third street to Summit, between Ninth and Tenth street.

Dunham place its whole length.

Bedford avenue, from Division avenue or Broadway to Taylor street.

Lee avenue, from Division Avenue or Broadway to Rodney street.

Marcy avenue, from Division avenue or Broadway to Keap street.

Wilson street, from Lee avenue to Division avenue or Broadway.

Ross street, from Lee avenue to Marcy avenue.

Rodney street, from Marcy avenue to Ninth street.

Clymer street, from Bedford avenue to Lee avenue.

Taylor street, from Bedford to Lee avenue.

Ninth street, from Division avenue or Broadway to Rodney street.

The said Commissioners will meet at their office, Halsey's Buildings, No. 355 Fulton street, Brooklyn, on Thursday, the 13th day of August next, at 10 o'clock, A. M., to hear objections to said assessments, which may in the meantime be examined at their said office by all parties interested.

Dated Brooklyn, N. Y., July 16, 1860.

GAMALIEL KING, President.

DANIEL L. NORTHUP, Secretary

GAS AND OIL-COALS, Foreign and Domestic.—Orders promptly executed at the lowest market prices. For sale by HORATIO EAGLE, Agt., 254 Canal-st., N. Y.

OFFICIAL.

UNITED STATES OF AMERICA.—War Department, July 17, 1860.

1. Captain H. W. Benham, corps of engineers, in addition to his present duties, is hereby appointed Chief Engineer of the Washington Aqueduct and Potomac Water Works, and will have the direction of all the operations for their completion and preservation; will appoint all the necessary assistants, clerks, workmen, &c., and certify all bids for materials or labor for payment by the officer under whose superintendence the appropriation is to be expended.

2. Capt M. C. Meigs, as the disbursing officer of these works, will, in accordance with the above act of Congress, furnish to the chief engineer, in full detail, all the plans and estimates for these operations, and examine the works under construction from time to time, for which every facility will be afforded him by the chief engineer; and he will keep such general supervision of the works as to assure himself that they are being constructed according to his said plans and estimates; and if at any time finding variations therefrom, he will promptly report the same to the chief engineer for correction; and if necessary, to the Secretary of War.

3. He will also be charged with all the disbursements of moneys for these works, and the making of the payments for all materials and labor for the same upon the written certificates of the chief engineer, of the amounts due, or upon the order of the Secretary of War.

4. To aid Captain Meigs in these duties he will be authorised to employ a draughtsman, if necessary, and also a clerk.

5. As soon as the plans and estimates are furnished to the Chief Engineer, he will make arrangements for the most vigorous prosecution of the works, and he will report to the Secretary of War, for his approval, the number of assistants, clerks, &c., that he may require, designating the persons and the compensation proper for each.

JOHN B. FLOYD, Sec'y War.

By order of the Secretary of War:
W. A. NICHOLS, Ass't Adj't Gen'l.

OFFICE OF THE METROPOLITAN GAS COMPANY, of the City of New-York, No. 15 Nassau street, basement of the Bank of the Commonwealth, New-York, July 26, 1860.

The Directors of the Metropolitan Gas-Light Company, having resolved to issue THREE HUNDRED AND EIGHTY THOUSAND DOLLARS of their Capital Stock, in addition to the amount heretofore subscribed, books of subscription will be opened at their office, No. 15 Nassau st., on the 27th inst., and remain open from 11 to 3 o'clock daily, until August 10.

Terms of subscription—Ten per cent. cash at the time of subscribing, and the balance in monthly instalments not exceeding ten per cent.

The Directors reserve the privilege of apportioning the stock in case the subscription should exceed the amount stated. By order.

OSCAR ZOLLIKOFFER, Treas. and Sec'y.

DANIEL THOMPSON, Machinist and manufacturer of Stop Cocks, Fire Plugs, &c., for Water-Works, STOP COCKS, VALVES, DRIP PUMPS, &c., for Gas-Works, No. 133, Elfreth Alley, Philadelphia.

AT A MEETING OF THE Directors of the Rochester, N. Y., Gas-Light Company, held on the 10th instant, the following resolution was unanimously adopted,

Resolved that it is proposed to increase the capital stock of the Rochester Gas-Light Company—by the addition thereto of forty thousand dollars—to the amount of two hundred and forty thousand dollars, which is deemed sufficient and proper for the purposes of the Corporation, and that a meeting of the Stockholders be called for the purpose of making such increase, to be held at the Office of the Company, on Mumford Street, in the city of Rochester, on the 6th day of August, 1860 at 10 o'clock in the forenoon; and that notice thereof, signed by at least a majority of the Directors, be published and given in the manner prescribed by law.

In accordance with the said resolution, notice is hereby given that a meeting of the Stockholders of the Company will be held at the Office of the Company on MONDAY, the 6th day of August next, at 10 o'clock, A. M., to decide upon the proposal to add $40,000 to the capital stock of the Company.

JOSEPH FIELD,
L. A. WARD,
LOUIS CHAPIN,
THOS. C. MONTGOMERY,
D. A. WATSON.

Rochester, N. Y., July 11, 1860.

OFFICE OF WATER COMMISSIONERS, Jersey City, July 13, 1860.—Notice to Machinists and Builders.—Sealed Proposals will be received at the office of the Water Commissioners of Jersey City until Tuesday, August 14, at 3½ o'clock, P. M., for the construction and erection, on the foundations now prepared, of a Cornish Beam Pumping Engine and two Drop Flue Boilers, at the Engine House of the Jersey City Water Works, situate on the Passaic River, opposite the village of Belleville, N. J. Also, at the same time and place, separate proposals for the necessary extension of the present boiler and house, and the masonry required for setting two boilers. Plans and specifications of the work may be seen at the office of the Engineer on and after July 18. The Commissioners reserve the right to reject any or all of the bids, if deemed for the interest of the city.

ERASTUS RANDALL,
President of the Board of Commissioners.

TO GAS-LIGHT AND WATER Companies:

SARONY, MAJOR & KNAPP, practical Lithographers, Engravers and Printers, No. 449 Broadway, design and execute CERTIFICATES OF STOCK for Gas and Water Companies; also, CHECK AND NOTE BOOKS, with Vignettes of Meters, Gas-Holders, Reservoirs, &c., and all other special and commercial work, at the lowest prices.

GAS-METER MANUFACTORY.
JOHN G. GRIFFIN & CO.,
No. 7 Beekman-St., & 76 West 37th St.,
NEW-YORK CITY,
Manufacturers of Wet and Dry Gas-Meters, Station-Meters, Show-Meters, Meter-Provers, Pressure-Indicators, Pressure-Registers, Pressure-Guages, Mercury-Cups, Centre-Seals, &c., &c.
☞ ALL METERS SEALED BY THE STATE INSPECTOR.

CAST-IRON PIPES.—EARL'S IRON WORKS, NEWARK, N. J., 91, 93, 95, 97 and 99 Chestnut street. Branch Office, 21 Centre street, New York.

The subscriber continues to manufacture Super or Cast-Iron Gas and Water Pipes, Branches, Bends, Angles, Bevel Hubs, Reducer, Sleeves, Drip Syphons, Plugs, Caps, Retorts, Bench Castings, and Castings in general. Particular attention paid to all Castings connected with Gas Works. E. B. EARL.

THE AMERICAN PUMP. This valuable invention has now been in operation one year, and gives universal satisfaction. Drawings and prices sent free. Patent rights, and rights to sell in limited territory, for sale on good terms. Address JAMES M. EDNEY, No. 147 Chambers' street, New-York. One of these Pumps may be seen at the Rooms of the AMERICAN GAS-LIGHT JOURNAL. For Engravings, see page 188 of this JOURNAL.

BURNELL'S Patent Rotary Pump—adapted to all purposes of pumping, from the well and cistern to the steam-fire engine. The most simple, durable, and efficient pump yet made. Principal sales depot at No. 23 Platt-street, N. Y. SAM. B. LEACH.

ANDREWS' Patent Centrifugal Pumps.—Where power is available, they are superior to all others, requiring less power, are more simple and durable, will pump sirups, coal oil, sand, fine ore and coal, corn, tan bark, &c., without injury or derangement, adapting them peculiarly to mines, tanneries, breweries, distilleries, oil factories, drainage, irrigation and wrecking. For descriptive pamphlet with price list, address

WM. D. ANDREWS, No. 414 Water-street, N.Y.

PLASTIC CARBON FILTERS.—The most simple, effective and reliable means of purifying water without trouble or loss of time; may be used for all domestic and manufacturing purposes, and will be furnished in various sizes, by A. G SCHELLER, No. 36 Beekman street, New York

HARPER & O'CONNELL, Manufacturers of Gas Shades and Globes of every description. FRENCH COLORED GAS SHADES AND SMOKE BELLS Nos. 63 and 65 Elizabeth street, corner Hester, New York.

GASOMETER FOR SALE.—Capacity 6,800 feet. In perfect order, with Cast-Iron Guide-Frame, Balance-Weights and Chains. Good as new. Cost $1,200. Will be sold for $500. Address "K," Box 406, Philadelphia Post Office.

DAVID JONES, Ornamental Japanner, South west cor. of Ninth and Melon sts., Philadelphia, respectfully solicits a liberal share of patronage from the manufacturers of Gas-Meters and others. He is prepared to execute all orders for Japanning promptly and reasonably.

Reference—Code, Hopper & Gratz, Gas-Meter Makers, Phila.

THE THREE GREAT AMERICAN PATENTS.

1.—Cast-Iron Mail-Stations for Public Lamp-Posts.

The Cities of New York, Brooklyn, Williamsburgh, and Philadelphia, are already supplied with these Boxes, and the Cities of New Orleans, Mobile, Cincinnati, Louisville, St. Louis and others will soon follow. The admirable working of this system will cause it to be adopted by the Postmaster-General, throughout the Union. The revenue of the City Mail Delivery of New York has already materially increased since the adoption of the Lamp-Post Letter-Boxes.

2.—Improved Mode of Setting Gas-Meters in the Walls of Buildings.

This Improvement consists of a neat cast-iron box-frame, highly ornamented, set in the Front Walls of Buildings, secured by a Patent Lock and Key, to contain the gas-meter, so that the Inspector can open it from the outside and take the record of the Index.

The advantages are two-fold. It prevents access to dwellings by Burglars, under pretence of being gas-inspectors; and, it avoids the trouble and confusion to families and to inspectors, of passing through rooms and cellars, many of which are dark and full of goods and coals or provisions.

3.—New Patent for Revolving Lights for Signalizing Ships at Sea.

By this system, the Lights being attached to the wheel-houses of Steamships, they revolve with the wheels, and an endless variety of signals may be used. The starboard lights being green, and the larboard red, and either or both so arranged as to be instantly reversed, advanced, thrown out of gear or stopped. They can, by the combination of "Rodgers' Code of Signals"—now before Congress for adoption—form a complete vocabulary of language. For either or all of these Improvements, Address

ALBERT POTTS, Patentee,
PHILADELPHIA.

CODE, HOPPER & GRATZ,

1500, 1502 and 1504 FILBERT-St., PHILADELPHIA.

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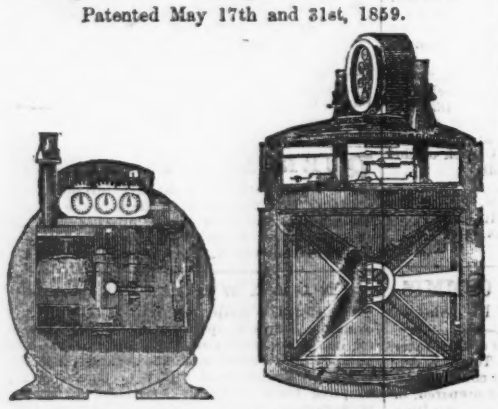
Pressure Registers, Pressure Indicators, Pressure Gauges, Photometers, Governors, Station Meters, Customer Meters, (Wet and Dry,) Experimental Meters, (Wet and Dry,) Show Meters, (Wet and Dry,) Meter Provers, Centre Seals, &c.

The high reputation which we have enjoyed for more than twenty-two years, and the fact that we have manufactured a greater number of Gas-Meters than all other manufacturers in this country combined, must present itself as a security to parties desirous of securing the most reliable instruments. Having completed a most extensive addition to our Factory, and added many important improvements to our machinery, we are enabled to fill orders entrusted to us with dispatch, and in all cases *Guarantee Entire Satisfaction.* Our Patent Rotary-Valve Dry Gas-Meter is now used by upwards of Two Hundred Gas Companies, giving general satisfaction; we therefore recommend it, believing it superior to any other Dry Gas-Meter manufactured. All Meters tested separately by a sworn Meter-Inspector, and sealed when desired.

HARRIS & BROTHER'S

Improved Dry Gas-Meter,

Patented May 17th and 31st, 1859.



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No. 1117 Cherry St., Philadelphia.

McKINNY & KELLY,

MANUFACTURERS OF

Coal-Scoops

AND

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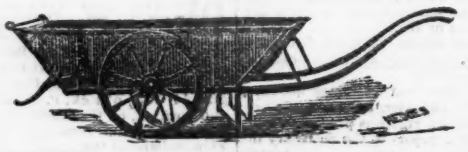

FOR GAS-WORKS.

FURMAN-St., Near Fulton Ferry, Brooklyn, N. Y. Samples are on Exhibition at the Rooms of THE AMERICAN GAS-LIGHT JOURNAL.

WILLIAM ROY,

93 Beaver Street.

NEW YORK, IMPORTER OF THE CELEBRATED PERCETON FIRE-CLAY RETORTS the quality of which is superior to any other clay yet discovered. Analysis as under:

Silica	62.5	Magnesia	0.3
Alumina	35.0	Prox. of Manganese	0.2
Prox. of Iron	0.9	Phos. of Iron	0.5
Lime	0.6		

VITRIFIED FIRE-CLAY PIPES, from 2-inch to 36-inch, diameter, in lengths of two or three feet; are indestructible, and not affected by gases or acids.

Thomas Edington & Son's PATENT CAST-IRON PIPES are cast vertically to any weight required. They can also be coated with Dr. Smith's Solution, which prevents corrosion; adapted for gas and water. Made in lengths of nine and twelve feet, or turned and bored joints.

WROUGHT IRON TUBES and all materials for gas and water works. Fire-Bricks, Fire Clay, Water Hydrants, Scotch and English Cannel Coal, &c. Kennedy's Water Meters for measuring the flow of water—indispensable to all water companies.

LAND IN CANADA, for Gas-Light Shares.

Town of Coburg,	Northumberland Co.	14	acr's
Do Hamilton,	do	do. 100	"
Do N'th Monaghan,	Peterboro'	do. 600	"
Do South	do	do. 100	"
Do Dummer,	do	do. 100	"
Do Douro,	do	do. 223	"
Do Haldimond	Northumber'nd	do. 200	"

These lands are well located, and will be exchanged on equitable terms for sound, dividend-paying gas-light shares in the United States or British Provinces.

Apply or address E. R. L., Post-Office, Toronto, Canada, or at Rooms of AMERICAN GAS-LIGHT JOURNAL, New York.

CLEGG'S TREATISE ON Coal-Gas Manufacture, third edition, with full instructions upon every detail incident to Gas-making, illustrated by Engravings. A large supply has arrived. No Gas Company or Engineer should be without it.

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LE JOURNAL DE L'ECLAIRAGE AU GAZ, published in Paris on the 5th and 20th of each month.

American subscriptions are received at the Rooms of the AMERICAN GAS-LIGHT JOURNAL, N. Y.

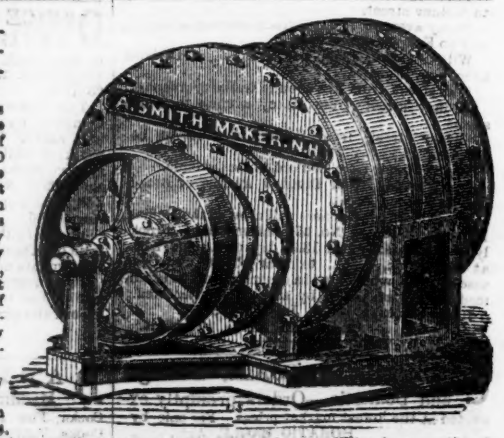
ANALYTICAL & Manufacturing Chemistry.—Gesner's Chemical and Engineering Rooms, 24 William-street, New York Rooms No. 28 and 29. Analysis made of all mineral and commercial articles. Coal oils tested, coal oil works erected, and contracts made. The best processes for purifying and deodorizing; coal and petroleum oils furnished, with skilful workmen and superintendents. Mines surveyed and coal tested.

The Kerosene patents, from which the coal oil business in the United States originated, were granted to Dr. Gesner, Chemist and Geologist.

THE ANNEXED CUT REPRESENTS MACKENZIE'S PATENT GAS EXHAUSTER (Force Blast.)

It is offered to Gas Companies as a most perfect Machine. They are made of various sizes, capable of exhausting from 5,000 to 150,000 cubic feet per hour. They require less power, work smoothly, are not out of order, and cost much less than the imported ones. Gas companies intending to use an exhauster, by stating the quantity of gas they may wish to have pass through per hour, will be furnished with a statement of the proper size, and the price of the same, on application to ADDISON SMITH, Manufacturer, New Haven, Conn., or to Messrs. ELLIMAN BROTHERS, New York.

The manufacturer has the liberty to refer to the Albany, N. Y., Gas-Light Co., where one has been in constant operation for many months. Another one, capable of exhausting from 50,000 to 70,000 cubic feet per hour, will be in operation in a few weeks, at the St. Louis Mo., Gas-Works



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THE OLD TUBE WORKS, WEDNESBURY, AND THE ALMA WORKS, WALSAL, STAFFORDSHIRE

69 UPPER THAMES-ST., & 5 CHARLES-ST., SOHO, LONDON;

AND 35 GRANBY-ROW, MANCHESTER, ENGLAND.

The original Manufacturers of WROUGHT IRON GAS TUBES, and the Inventors of the Lapwelded Tubes for Locomotive and Marine Boilers. All kinds of TUBES and FITTINGS, whether for Gas, Steam, or Water. Galvanized and Composition Tubes. Chandeliers, and every kind of Brass-work for Gas and Steam.

STOCKS, DIES, AND TAPS OF ALL SIZES. CAST IRON PIPE AND GAS-METERS.

ALL GOODS WARRANTED.

CANDLES FROM COAL.—A New Invention, Manufactured by the NEW YORK PARAFFINE CANDLE COMPANY, UNDER MEUCCI'S PATENT.

NEW-YORK PARAFFINE CANDLE CO. A. MEUCCI'S 1859 PATENT.

These Candles being made from one of the products of the distillation of Coal, and having the same chemical constituents as gas, being, in fact,

GAS SOLIDIFIED,

are eminently adapted for giving light. They took the highest premium at the late Fair of the American Institute, held October, 1859, as may be seen from the following extract from the report of the Committee:—

"Our tests with the Photometer showed that the Paraffine Candles above referred to, as compared with the best Sperm, had greater illuminating power, gave a softer and pleasanter light to read by, and burned full ten per cent. longer than the standard Sperm Candle, and we recommend it as deserving the highest premium of the Institute.

"ISAIAH DECK, M. D.,
"Analytical and Consulting Chemist
"JOSEPH YATES,
"Civil Engineer."

The Candles manufactured by this Company are warranted to stand all climates, will not run or gutter, and require no snuffing and, unlike some other so-called Paraffine Candles,

DO NOT SMOKE IN BURNING OR BECOME YELLOW WITH AGE, AND ARE WITHOUT ODOR.

CAUTION.—As an Imitation Candle is already offered in the market, purchasers should bear in mind that every box of Candles sold by this Company is stamped with its adopted trade mark, which is a circle, enclosing the words, "NEW YORK PARAFFINE CANDLE CO., MEUCCI'S PATENT, 1859," with our trade mark as above, to imitate which is felony by law.

WM. E. RIDER, 16 Beekman-st., N. Y.,
Agent for the Company.

STANDARD Photometric Candles.—Owing to a number of Applications made to me for information concerning the supply of the "Standard Sperm Candles," used in Photometrics, I have obtained a supply, from which I can furnish those who require them with full directions for use. T. W. PARMELE,
No. 4 Irving Place, New York.

D. C. GREEN'S PARAFFINE 42½ Gall. Lubricating Oil.—228 Pearl street, New York. Benzole, Crude Coal Oils, Naptha, Burning Coal Oils, Paraffine, Paraffine Candles.

COAL OIL.—10,000 Gallons Celebrated Kerosene Coal Oil, 5,000 Gallons Boston Coal Oil, and other brands, at $1.25 per gallon. STANFORD BROTHERS,
Pacific Oil and Camphene Works, cor. of Front and California streets, San Francisco, Cal.

EMPIRE STATE COAL OIL CO.—Manufacturers of Refined, Bleached, and Deodorized Coal Oil, Factory on Smith street, Brooklyn, L. I.; Store, 240 Pearl street, corner Burling Slip, New York.

HENDRICKSON & SHATTUCK, Manufacturers of the Excelsior Lubricating Oil, Philogene and Paraffine Oils; also, Dealers in Sperm, Lard, Whale, Elephant, Tanners', Tallow, Coal, Neat's-foots, Paint and other Oils. Office, No 22 Cedar street, between William and Pearl streets. D. W. HENDRICKSON,
ALBERT G. SHATTUCK,
New York.

DEPOT AND WAREROOM of the New-York Columbian Oil Company, 58 Courtland street, New York.
G. W. WHEATON, Agent.

COPE'S PATENTED COAL OIL Pump.—Reliable and effective. Manufactured by S. CUMMINGS & SON,
No. 102 Front-st., Cincinnati, O.

J. L. McREA, Dealer in Coal Oils and Lamps, Binnacle and Signal Light Oils, 139 Water street, New York.

DANIEL WADSWORTH & CO., Coal Oil Manufacturers, Wholesale Dealers in Oils and Naval Stores, and Commission Merchants.
DANIEL WADSWORTH,
DECIUS WADSWORTH,
207 Pearl street, New York.

ORION COAL OIL WORKS—Office, 116 Maiden Lane, New York.—Illuminating, Crude and Lubricating Oils, Paraffine, Naptha and Paraffine Candles; constantly on hand an assortment of Coal Oil Lamps.
Agent for STODDARD'S ONE AND TWO-HORSE MOWING MACHINE. Office 116 Maiden Lane, New York.
WILLET HICKS, Agent.

FRANKLIN COAL OIL WORKS.—Paraffine, Benzole, Naptha, Distilled Crude Oil, Axle Grease, Pitch.
ROBERT A. CHEESEBROUGH,
Depot 204 Pearl st., cor. Maiden Lane, N. Y.
Works on Red Hook, Brooklyn, manufacturer of Illuminating, Lubricating, Binnacle and Head Light Coal Oils. Also, Agent for the Aladdin Coal Oil Works, Pittsburg.

CARBON OIL CO.—191 Pearl St, near Maiden Lane, N. Y.—Carbon Oil is the product of pure Petroleum, (from the Oil Wells of Pennsylvania,) which makes an illuminating Oil of greater purity than any other Mineral Substance known. Is not explosive, and is for sale, with a general assortment of Lamps, Burners, Chimneys, &c.
DIRECTIONS.—Trim the wick even with the tube, (clipping off the corners slightly). After lighting and putting on the chimney, allow the flame to burn low for a minute, to prevent breaking the chimney. While burning, the wick must always be kept below the top of the cone.

CRUDE COAL OIL For Refiners.—The North American and Lucesco Coal Oil Companies, of Pennsylvania.
J. P. HARLEY, 16 Wall st.,
WM. C. UHLHORN, 9 South William-st.,
Agents, New York.

TO COAL OIL REFINERS.—Having made arrangements with the Proprietor of the principal wells yielding Petroleum, or Seneca Oil, in the State of Pennsylvania, we are constantly receiving supplies, and are prepared to offer this article on the most favorable terms, and in quantities to suit purchasers.
SCHIEFFELIN BROTHERS & CO.,
170 William street.

P. CONWAY, Manufacturer of Oil Cans, square and round, of every size, Druggists' and Shipping Cans made tight, and delivered to any part of the city, by sending to No. 138 MAIDEN LANE, N. Y.

Rosin Oil and Rosin.—For sale of our own manufacture a superior article of ROSIN OIL, for Gas purposes. Also Refined Oil. For shipment in secure iron-bound barrels, or by any single barrel.
Address MARYLAND GAS COMPANY, No. 6 Bank of Baltimore Building, Baltimore, Md.
P. S. This Company is also prepared to construct their superior Patented GAS WORKS of any capacity, from that required for a private dwelling, hotel, church, college or factory, to such as will supply cities and towns, complete in all their parts for the manufacture of GAS, from either Rosin Oil, Coal, or Rosin.

WHEELER & HOYT.—Distillers of Camphene Alcohol, and Manufacturers of the best quality of burning Fluid; also, Dealers in Oils and Naval Stores of every description. Office, 105 Pearl street, near Maiden Lane, New York.
F. A. WHEELER,
H. S. HOYT.

JAMES A. WEBB, Manufacturer of Alcohol, Camphene, and Burning Fluid, No. 165 Pearl street, New York.

AARON SEELEY, Manufacturer of Burning Fluid, Camphene, and Alcohol, No. 32 Burling Slip, New York.

J. H. BRUNDAGE & CO., Manufacturers of Burning Fluid and Camphene, No. 38 Burling Slip, New York.

STREET GAS-LANTERNS.

Cities and Gas Companies furnished at reasonable rates with Lanterns, Iron Frames, Grazed Complete or Separate. Also, FANCY LANTERNS, for Hotels, Restaurants, Theatres, Telegraph Offices, Churches, and other Public Buildings. Having been in the business for many years I fully understand the manufacture of Gas Lanterns, and with the aid of machinery can make the parts cheaper than any other manufacturer. Orders from a distance solicited, and executed promply.

A. C. PARRY,
31 Race Street, Cincinnati, Ohio.

ENAMEL DIALS FOR GAS AND WATER METERS.
BOTTOMLEY & HINES, MANUFACTURERS, West Philadelphia, Pa.
The best, therefore the cheapest for Gas and Water Meters and Engineers' Indicators.
These Dials are particularly adapted to all purposes where gas, gas-vapors, or acids, are present. Also, Watch and Clock Dials of every description, from any size up to 14 inches diameter.
The undersigned embrace this opportunity of returning their thanks to the gas-meter manufacturers throughout the United States, for the very liberal patronage they have received for the past ten years, during which they have been established in Philadelphia, which has placed us ahead of all competition. Our sales for the past year have been far greater than we could have anticipated, with the prospects of a steady increase. Our constant aim has been, and will be, to adopt all improved processes of manufacture, combining improvement in quality with reduction in price. All Dials made by us are warranted to be as represented, and of the best materials and workmanship, which will recommend them to all parties wishing the very best. Circulars sent free by mail, or on application.
We are the appointed agents for HUNTER, SHEARMAN & CO.'S make of BRASS PINION-WIRE for Gas-meters, which we believe is equal to the best.

A. & G. BRANDON, Manufacturers of Street and Fancy
LAMPS,
of every pattern, for Hotels, Saloons and Public Buildings, on hand and made order.
Cities, Villages, and Gas Companies supplied with Street Lamps, on favorable terms. Office, No. 4 TYRON ROW, City Hall Square, and Manufactory, No. 102 Mulberry street, one door from Canal street, New York.

PARAGON SELF-GENERATING
GAS-LIGHT BURNER.

Complete in itself, without other machinery. Applied with founts to gas-fixtures in every variety; also, to hand-lamps such as use oil, burning fluid, coal oils, &c., making its own gas in the burner, *with entire safety from burning fluid.* Devoid of smell, smoke, or flicker; combining simplicity, economy and brilliancy of light in any temperature; adapted to and used by churches, factories, dwellings, hotels, steamers, railroad cars omnibuses, private carriages, street lamps, &c., &c.—all at an expense of less than one cent per hour each burner. Call and see this light for the million, or send for circular,
BUTLER, HOSFORD & CO.,
30 Broadway, N. Y

State and county rights for sale. Parties wanting gas in large or small quantities, should apply as above before making other engagements.

SCHWARZ'S PATENT STEATITE, or Lava Gas-Burner Tips.—These obtained a Gold Prize Medal in Europe, where they are now extensively used in place of metal tips. In Prof. Liebig's and other Chemists' works, these burners are recommended as *indestructible by acids or alkalies, unchangeable by heat or cold, not liable to rust or corrosion,* and superior in economy to the metal tips. Boston and other cities have adopted them for street lights after a satisfactory trial. They are imported from Germany by the undersigned, sole Agent for America, who can now supply the trade or cities at reduced prices, with any pattern of tips to fit the double cylinder or other kind of burners. For sale also, Large Gas Heating Burners, of same material, for Chemists, &c. W. W. WARREN,
25 Kilby-st., Boston.

H. P. GENGEMBRE'S PATENT, Non-Freezing and Non-Evaporating Gas Meter Fluid.
A meter once filled with this fluid, costing only from 10 to 15 cents per gallon, will require no further attendance; will allow any amount of gas to pass through without affecting the level of the Fluid, and will work equally well in winter or summer, however exposed it may be.
I have appointed A. L. BOGART, No. 592 Broadway, New York City, my Agent for the New England States and the State of New York; and A. DOISY, Box 1130, Cincinnati, O., my Agent for the balance of the United States; but no assignment or licenses for using my patent will be valid without being ratified and signed by myself.
H. P. GENGEMBRE,
Box 48, Alleghany City, Pa.

FRINK'S GAS-LIGHT Reflectors, For Show-Windows, Billiard-Tables, Desks, Churches, Halls, &c.
Frink's Improved Day-Light Reflectors for obviating the use of Gas entirely in the day-time. Frink's Gas-Light Reflecting Shades for Banks, Offices, Parlors, &c. Frink's Concave Gas-Light Reflectors. No. 104 Worth street, third door east of Broadway, New York.

FREEZING OF GAS-PIPES.—Walton's Patent Anti-Freezing Apparatus illustrated by engravings, in the AMERICAN GAS-LIGHT JOURNAL, of Jan., 1860, page 141, is the most simple, durable and efficient of any known process.
According to Professor Faraday, the watery vapor contained in illuminating gas amounts to 0·0093 parts where the gas is at a temperature of 40°, or in other words, that there are 1, 7-10 *gills water in every* 1,000 *cubic feet of gas* at that temperature. It is the deposit of this water in the form of frost that closes the exposed pipes.
Walton's plan is, in a few words, to supply this water with a sufficient quantity of alcohol (98–100ths), the vapor of which will enable it to pass through the most exposed pipes, unaffected by frost. Experiments of three years prove that one gill of such alcohol will protect 1,000 feet of gas at any temperature. Private houses, Hotels and Gas-works, can be thus guarantied from frost by the use of Walton's Anti-Freezer, which consists of but two or three small castings, at the most trifling cost. It can be applied at Gas-works without altering any of the pipes; and the expense of labor and the alcohol will not exceed two cents per 1,000 feet of gas.
It can be seen in operation at the rooms of the AMERICAN GAS-LIGHT JOURNAL, where orders will be executed at once.

Read the Following Testimonials:

GAS WORKS, CINCINNATI, O., 24th May, 1858.
MR. JOHN WALTON, Louisville, Ky.:
DEAR SIR,—At an earlier date, I intended to have written you the result of my experience during last winter, in regard to your patented apparatus to prevent the freezing of gas in pipes. I am quite convinced that both in theory and practice your apparatus is correct, and in no case will it fail to prevent the freezing in pipes of our illuminating carburretted hydrogen gas, provided attention is paid to renew the alcohol often enough in proportion to the amount of gas passing through the anti-freezing apparatus.
Yours truly, JOHN JEFFREY.

OFFICE LOUISVILLE, KY., GAS CO.,
March 30th, 1860.
In the winter of 1856, this Gas Company first applied John Walton's patent method for the prevention of Frost in Service Pipes,—to this date we have used it with perfect success. *This Company have Purchased the Right to this Patent for Louisville, Kentucky.*
The application of a vessel, containing a small quantity of alcohol, placed between the gas main and an open area connected with a building, through which the service pipe was laid, has always prevented the freezing or stoppage of the service pipe, although the temperature may have ranged from the freezing point to several degrees below zero.
As the alcohol absorbs from the gas any vapor of the water that may be passing off with it, after passing the vessel containing alcohol, there remains in the gas nothing that can freeze or close the pipe. *This simple application, we have proved to be an effectual safeguard against the closing of gas pipes with frost.*
ROBERT G. COURTENAY, President.

DIMMOCK, DWIGHT & CO., Engineers and Contractors for the erection of Coal Gas-Works. Offices 135 and 137 William street, New York city; and No. 2 Elm street, Springfield, Mass.
REFERENCES BY PERMISSION:
GEORGE D. MORGAN, Esq., New York.
AARON CLAFLIN, Esq., "
A. B. WOOD, Esq., "
GEORGE BLISS, Esq., N. Y., Pres. M. S. & N. I. R. R. Co.
GEO. M. ATWATER, Esq., Springfield, Mass.
JAS. D. BREWER, Esq., Pres. Springfield Gas Co.,
JOHN I. BAKER, Esq., Pres. Beverly Gas Co.,
HENRY E. RUSSELL, Esq., Pres. N. Britain Gas Co.,
J. DUNHAM, Esq., Pres. Norwich, Ct. Gas Co.,
W. C. STREET, Esq., Sec. Norwalk Ct. Gas Co.

F. A. SABBATON, ALBANY, N. Y., Gas Engineer and Contractor.
COAL AND ROSIN WORKS of any capacity constructed on the most approved plans.
Refers to CHARLES ROOME, Esq., Prest. Manhattan Gas-Light Co., N. Y.; R. PUMPELLY, Esq., Pres. Albany, N. Y., Gas-Light Co.; J. K. BRICK, Esq., Engineer Brooklyn, N. Y., Gas Co.

BURTIS' PATENT COMPENSATING COUNTERBALANCE FOR GASOMETERS.—This Improvement consists in making the attachment to the Gas-Holder by counterweights in such a manner as to effectually prevent it from getting out of level so as to bind, and also to prevent any escape of Gas at Cup or Hydraulic seal, where the Holder is on the Telescopic plan. Holders that work out of level, are thus evenly balanced, and prevented from binding or lodging against Tank-wall and falling down, thereby being rendered unfit for service. Where Holders or sections of Holders cannot be used on account of the above difficulties, this arrangement will remove them, and place the Holder in good working order; moreover, with this attachment, deep tanks are not necessary.

BURTIS' COUNTERBALANCE has been in use for three years at the Gas-Works, Chicago, Ill. Its resistance to high winds and snow-drifts, is alone sufficient to recommend its general adoption. For Engravings, see AMERICAN GAS-LIGHT JOURNAL for June, 1860, page 221. Address

P. T. BURTIS,
Engineer Gas-Works, Chicago, Ill.

BEAUMONT'S Metallic Thermometers, Barometers and Steam Gages, for Gas-Light and Water Companies. These instruments are entirely Accurate, Portable, and Reliable. Manufactured and for Sale by

VICTOR BEAUMONT, No. 175 Centre-st., N. Y.

For Engravings, see AMERICAN GAS-LIGHT JOURNAL, for May, 1860, page 221.

C. R. WOODWORTH,
Manufacturer of
PORTABLE GAS WORKS,
74 WALL STREET,
New York City.

BUTLER'S PATENT PORTABLE Gas-Works are designed for Dwellings, Churches, Factories and Country Villages, as well as for large consumers in cities. They make gas from CRUDE ROSIN, and are WARRANTED to make as rich an article, at less than ONE HALF the cost of that made by the old method in Portable Gas-Works, and at one-third the average price of Coal-Gas as sold in cities. Great savings in expense of light GUARANTEED to large consumers.

Works of all sizes furnished to suit applicants. Main Service and Distributing Pipes put in. Also, a large assortment of Gas-Chandeliers, and other fixtures on hand, at the lowest prices.

The ATLANTIC HOUSE, BROOKLYN, with 260 burners in constant use, make their own gas with my apparatus, and obtain results as stated above. This, (with a small one at my store,) can be seen in operation by application at my office, where descriptive pamphlets, with the names of numbers who are using them, will be furnished.

JOHN BUTLER,
Nos. 99 Fulton & 15 Henry-st., Brooklyn, N.Y.

FOR LIGHTING R. R. CARS, Steamboats with Gas.—The process by which the holders of a train required only three minutes. Where the cars can remain on track for thirty minutes, the gas is passed directly from the pump through the pipes to the holders, thus doing away with the reservoir entirely; this may be done at either end of the road. This apparatus has been used on the New Jersey railroad nearly two years and for more than a year on the Camden and Amboy R. R., and the Philadelphia and Reading R. R. The Camden and Amboy R. R. Co. have the apparatus on all their cars, and on two of their Ferry Boats. The uniform flow of gas is secured by a Patent Regulator. This apparatus is also adapted to Steamboats making trips of not over three or four days in length, and to the head lights of Locomotives.

It can be seen in operation at the Rooms of the AMERICAN GAS-LIGHT JOURNAL. For Engravings, see AMERICAN GAS-LIGHT JOURNAL for June, 1860, page 245.

Apply to the
NEW YORK CAR & STEAMBOAT GAS CO.,
No. 117 Fulton street, N. Y.

GAS FOR THE COUNTRY.—C. WOOSTER, Manufacturer of Improved Portable Gas Machines, for Villages, Public Institutions, Churches, Hotels, Railroad Depots, Factories, Mills, Machine-Shops, Plantation Dwellings, &c. Office, 256 Canal street, near Broadway.

This Machine has been in successful operation for years, in many of the best residences and factories in the country, and for simplicity of construction, ease of management and economy of light produced, possess advantages over all other machines for the purpose now in use. It is adapted to the making of Gas from Crude Rosin or Rosin-Oil, producing a Gas of twice the illuminating power of Coal-Gas, at about one half the price usually charged for that gas.

Every Machine is sold under a strict guarantee to operate according to representation, and no payment required until the fact is demonstrated by actual use.

For further particulars, and descriptive pamphlet containing references to numerous parties now using the apparatus, address

C. WOOSTER,
No. 256 Canal-st., near Broadway, N. Y.

For Engravings, see AMERICAN GAS-LIGHT JOURNAL, for June, 1860, page 245.

☞ Responsible Agents wanted, with whom liberal arrangements will be made.

APPLETON'S IMPROVED GAS-Works, for Factories, Hotels, Dwellings, and Towns. The most simple and economical works in use, furnishing a superior light to coal gas at a cost of one half a cent per burner per hour. It does not injure trees, or plate, and is not affected by cold. For Circular and Terms apply to APPLETON & GRAHAM,
56 Washington street, Boston.

For Engravings, see AMERICAN GAS-LIGHT JOURNAL for April, page 213.

JOHN COX & CO., No. 696 Broadway, cor. of Fourth street, New York. Importers of French and English Gas Fixtures of every description, Paris Clocks, Real Bronzes, &c. Manufacturers of Silver Ware.

GAS-APPARATUS FOR CARS. S. B BOWLES, No. 12 Gold street, New York, Manufacturer and Dealer in Railroad Supplies, including GAS APPARATUS FOR CARS, of the most approved design.

MARSH'S PATENT ROSIN or Sun-Light Gas-Works, for Private Dwellings, Hotels, Factories, Railway stations, Sugar-Houses, Towns, &c. By the peculiar construction of the Retorts, the largest amount of decomposing surface is obtained in the smallest space. 2d. Gas is manufactured from crude rosin, without the least deposit of carbonaceous matter in the retorts or pipes: thus enabling them to be operated continuously, generating rapidly the best and cheapest illuminating gas obtained from this material. ALFRED MARSH & CO.,
241 Broadway, New York.

ROSIN GAS-WORKS, for Factories, Hotels, and Public Buildings. These works may be seen in operation at the Berkshire Woolen Mills, Great Barrington, Mass.; Manchester Mills, Manchester, Conn.; A. A. Van Alen & Co's. Factories, Stvesant Falls, N.Y., and many other places. JAMES O. MORSE & CO.,
76 John-st., New York.

H. R. WORTHINGTON'S Patent Water-Meter.—This Meter combines accuracy, simplicity, and remarkable durability, with such ease and certainty of motion, as to offer no appreciable obstructions to the flow of water in the pipes to which it is connected, as it runs and registers upon three inches head, or when delivering the smallest stream. These qualities with its low cost, have caused its extensive adoption by corporations and individuals in many of our largest cities. Particular information can begiven at the office of the undersigned, where a Meter can be seen in operation.

For sale, at greatly reduced prices, WORTHINGTON'S STEAM PUMPS, extensively used by Gas Light Companies. Also, a new and highly successful PUMP, driven by water-pressure, requiring no attention or repairs, and the most economical water-motor yet constructed.

Patent GATES, for Water and Steam-stops
HENRY R. WORTHINGTON,
28 Broadway, N. Y.

One of these Water-Meters can be seen in operation at the Rooms of the AMERICAN GAS LIGHT JOURNAL.

PHILADELPHIA GAS FIXTURE Works.—Warner, Miskey & Merrill, Manufacturers, Store, No. 718 Chestnut street, Philadelphia. Warner, Peck & Co., No. 376 Broadway, New York, would respectfully inform the public that they continue to Manufacture all kinds of Gas Fixtures, Lamps, Girandoles, Bronzes, &c., and that their large and varied stock comprises the simplest as well as the most elaborate patterns, designed by their French artists. They also continue to keep at their store, 376 Broadway, a large and full assortment of all their manufactured Goods. Dealers and others are invited to call and examine.

Gas Fixtures and Fittings. RINGUET-LEPRINCE & L. MARCOTTE, Warehouse, 347 Fourth street.—Manufactory, 55 West Sixteenth street, New York.

RINGUET-LEPRINCE, 3 Rue de la Paix, Paris.

Painting, Paneling, Cabinet Work, Looking-Glass Plates, Mirror Frames, Silk, Worsted and Woolen Materials, Aubusson and Moquette Carpets, Gas Fixtures, Bronzes &c.

GAS FIXTURES TO BE SOLD at Wholesale Prices.—In consequence of alterations in his store, the Subscriber is obliged to dispose of his enire stock of Gas Fixtures. Those wishing to purchase at very low prices will do well to call. Gas Fixtures removed. Gas fitting executed in all its branches.

J. H. VAN REED 219 Bleecker St.

LOCKE & CRAIGIE, Plumbers and Gas-Fitters, No. 12 East 20th street, New York.

LOCKE, CRAIGIE & CO., Gas-Fittings, Chandeliers, Brackets, Globes, &c., No. 927 Broadway, New York.

☞ Particular attention paid to country work.

JAMES HELME, Chandelier and Gas-Fitting Establishment, No. 58, East Thirteenth street, between Broadway and University Place, New York.

DARDONVILLE, Importer of Paris Bronzes, Gas-Fixtures, Carcel Lamps, &c. French Rape Seed Oil for sale. No. 623 Broadway, New York.

B. DANNENHOLD. W. S. NOCK.

FIFTH STREET GAS-FITTING Establishment.—Dannenhold & Nock, Gas and Steam Pipe Fitters, also, manufacturers and dealers in Chandeliers, Bronzes, Pendants, Brackets, &c., &c.

D. & N.'s Patent Gas Burners, 99 West Fifth street, between Vine and Race,
CINCINNATI, O.

☞ Wrought Iron Gas, Steam and Water Pipe, at Wholesale Eastern Prices.

BRADBURY M. JOHNSON, GAS-Fitter and Plumber, No. 111 East Eighteenth street, New York:

A large and elegant assortment of CHANDELIERS, BRACKETS, &c. Gas-Pipe and Posts made for Gas Companies on favorable terms.

GEORGE H. KITCHEN & CO., Manufacturers of Fixtures for Gas Light purposes, Wood's Building, No. 561 Broadway, New York. Office of the Inspector of Gas Meters for the State of New York.

THOMAS NICHOLL, Gas and Steam Fitter and Plumber, Nos. 170 and 172 Centre street (next door to N.Y. Gas Co.'s office), New York. Pipes inserted in Churches, Factories and Dwellings; Chandeliers re gilt.

Jobbing promptly attended to.

FELLOWS, HOFFMAN & CO., (late Starr, Fellows & Co.,) Manufacturers of Gas Fixtures and Chandeliers, Solar, Camphene and Fluid Lamps, Girandoles, Hall Lanterns, &c., No 74 Beekman st., New York.

TIFFANY & COMPANY, Jewelers and Importers of elegant artistic PARIS GAS CHANDELIERS, BRACKETS, PENDANTS, &c., in Bronze and Gilt.

No. 550 BROADWAY, NEW YORK.

FRD. C. KRAUSE, Manufacturer of Patent Porous Gas-Burners for COOKING, IRONING, HEATING, CHEMICAL APPARATUS, &c., No. 772 Eighth Avenue, corner of Fifty-Fourth street, New York.

Samples are on exhibition at the Rooms of the AMERICAN GAS-LIGHT JOURNAL.

T. G. ARNOLD, Manufacturer of Gas Burners, Mercury Cups, Portable Sockets, Burner Pillars, &c., No. 447 Broome street (second door west of Broadway), New-York. Imported Scotch Tips and Burner Plyers always on hand

M'KENZIE & O'HARA, Plumbers and Gas-Fitters, No. 326 FOURTH STREET, CORNER OF MERCER ST., NEW YORK.

Water Closet Pans, Wine Basins, Wash Basins, Sinks, Fountains, Jets for public and private purposes, Stop-cocks, Filters, and all other Water apparatus.

ALSO, a complete assortment of Gas-fixtures, Pendants, Chandeliers, Brackets, &c. &c.

GAS FIXTURES AND FITTING. No. 707, Broadway, New York.

The largest and best selected assortment of Gas Fixtures and French Bronzes in the City for sale, at very low prices, by STEPHEN PHILBIN,
707 Broadway, Bet. Washington Place & 4th-st.

GAS FIXTURES at Half Price—A Pair of Four light English water-slide Chandeliers, fushia flower pattern, white and gold enamelled drops, &c. Will be sold at half the cost of importation any time before Saturday. Apply at 13 Gold Street, up stairs.

IMPROVED FURNACES FOR consuming Tar, and Heating Gas Retorts.

The undersigned has a valuable European invention for consuming Coal Tar as fuel in heating Gas Retorts. The same is patentable, and the advertiser desires some one who is engaged in the manufacture of coal gas to join him in patenting and selling the same. Documents will be shown showing a very large saving by the use of this process. W. D. RUSSELL,
201 Broadway, New York.

The following certificate will establish the advantages of this improvement.

HAMBURG (GERMANY) GAS-WORKS, } May 5, 1860.

The total quantity of tar consumed at these works was 3,8,310 gallons or 12,610 barrels, of 30 gallons each. From repeated experiments I find that 2 gallons of tar, burnt under this system, is equal in heating power to 1 bushel of gas coke. A bushel of coke is worth 4¼d. (9 cents), so that each gallon of tar consumed realized a value of 2¼d. (5 cents.) supposing the above large quantity of 12,610 barrels of tar had been offered for sale, we should scarcely have found a purchaser *at any price*; certainly its highest value would have been about ¾d. (1½ cents) per gallon, thus showing a net profit, by being able to consume it, of 1½d. (3 cents) per gallon, or £2364, 8s. 9d. ($11,762 18) per annum.

At the time when we were consuming from 1300 to 1400 gallons of tar per day, no smoke was visible at the chimney-top, *proving complete consumption*. I strongly recommend fire-clay retorts with these tar furnaces.

B. W. THURSTON, C. E.,
Gas Engineer.

GEORGE STACEY, Cincinnati, O., Manufacturer of single and Telescopic Gasholders, Wrought-Iron Bridges, Girders, Joists and Stairways, Coke and Coal Wagons, Rakes, Screens, and other Gas-works tools, Slide and Cup Valves, Bolts, Nuts, Chisels, Ladles and other tools, Wrought-iron roofs, for Slate and Corrugated Iron, Gas Purifiers, Washers, Centre seal Valves and other Gas apparatus, Boiler-plate Retort Lids. Refer to—

Cincinnati Gas Light & Coke Co.
Nashville Gas-Light Co.
Springfield Gas-Light Co.
Columbus Gas-Light Co.
Cleveland Gas-Light Co.
Covington and Newport Gas Light Co.
Memphis Gas-Light Co.
Indianapolis Gas-Light and Coke Co.
James H. Caldwell, Esq., New Orleans.
John Jeffrey, Esq., Cincinnati.

POOLE & HUNT, Baltimore, Md., are prepared to execute orders for
GAS-HOLDERS,
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OFFICIAL.

CLERK'S OFFICE, COMMON COUNCIL, PHILADELPHIA, July 7th, 1860.

IN ACCORDANCE WITH LAW and a Resolution of Common Council, the following bill, entitled "AN ORDINANCE TO CREATE A LOAN FOR THE FURTHER EXTENSION OF THE PHILADELPHIA GAS-WORKS," is hereby published for public information.

WM. F. SMALL,
Clerk of Common Council.

AN ORDINANCE

To create a Loan for the further extension of the Philadelphia Gas Works.

SECTION I. The Select and Common Councils of the City of Philadelphia do ordain, that for the purpose of enabling the Trustees of the Philadelphia Gas Works to enlarge and extend said Works, so as to meet the increasing wants of the citizens for gas-light, the Mayor of the city be, and he is hereby authorized to borrow, on the credit of the Corporation, at a rate of interest not exceeding six per centum per annum, such sums of money as the Trustees of the Gas Works may require, not exceeding Five Hundred Thousand Dollars; and without requiring the payment of any money therefor the City Treasurer is hereby empowered and directed, on the requisition of the Trustees of the Philadelphia Gas Works, to issue certificates of loan of the City of Philadelphia, in such amounts and to such parties as they shall designate, not exceeding said sum, which shall be applied to the payment of obligations that may hereafter be incurred in the enlargement and increase of the works, mains, service pipes, meters and fixtures, and to carry on the Gas Works in their charge, and in the manufacture and distribution of gas, and any premium that may be received by the said Trustees on the amount so borrowed, shall be placed to the credit of the contingent fund of said Gas Works: Provided, That at least one half of the money raised under that ordinance shall be expended for mains, service pipes, meters and their appurtenances.

SEC. 2. The certificates of said loan shall be of the following form and description, namely:

"Gas Loan No 11. Certificate No. —. Six per cent. loan of the City of Philadelphia, for the use of the Trustees of the Philadelphia Gas Works, issued under the authority of an ordinance of the City of Philadelphia, approved —— ——, entitled 'An Ordinance to create a Loan for the further extension of the Philadelphia Gas Works.'

"This certifies that there is due —— —— by the City of Philadelphia, —— Dollars, with interest at the rate of six per cent. per annum, payable half yearly, on the first days of January and July, at the office of the City Treasurer, in the city of Philadelphia; the principal to be paid at the said office on the first day of July, Anno Domini, Eighteen hundred and eighty-four, and not before without the consent of the owner thereof.

"In witness whereof, the Treasurer of the City has hereunto set his hand and caused the seal of the City of Philadelphia to be affixed, the —— day of ——, 18—, and the Controller has attested the same on the said day and year.

Attest:

—— ——,
City Controller.

—— ——,
City Treasurer."

The said Certificates shall not contain any fractional parts of One Hundred Dollars, and shall be transferable at the office of the City Treasurer.

SEC. 3. The said Trustees shall, on or before the thirty-first day of December and the thirtieth day of June in every year, until the said loan is paid, retain out of their receipts for the sale of gas and other products of the said Gas Works, the sum of four per centum on the amount of said loan, for which certificates may have been issued, which they shall pay to the City Treasurer, who shall apply three per centum thereof to the payment of the interest on the said loan, as the same may fall due, and to no other purpose whatever; and the remaining one per centum shall be paid over by the said Treasurer to the Commissioners of the Sinking Fund, who shall invest the same and its accumulations in the loans to the said Gas Works, or in the other loans of the City of Philadelphia, as a Sinking Fund, which is hereby specifically pledged to the repayment of said loan, and any surplus remaining after the payment of said loan shall be applied by the Commissioners of the Sinking Fund toward the extinguishment of other loans to said Gas Works, if, any, otherwise of the funded debt of the City of Philadelphia.

S. S. ASHCRAFT, Cincinnati, O., Manufacturer of Gas and Water-Pipes, with Branches of every description; Retorts for Gas and Oil Works; Gasholder Stands, Columns, &c.; Gas Purifiers, Condensers, and Gas Apparatus of all kinds; Foundry Work in general.

N. B.—A complete selection of Patterns on hand. Refer to any of the Gas Works in the Western and Southwestern States.

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